American Aviation

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FORTNIGHTLY REVIEW

Army Freight

SECRETARY of War Stimson's announcement that the Army is giving the airlines a war job to do is a significant and highly important move in itself but this favorable step should not cause anyone to overlook the larger and more fundamental advancement of the war effort which this step makes possible.

It goes without saying that any such move which permits the full use of the air transport *organizations* in the war effort, and at the same time permits the retention of commercial air operations, is highly desirable from all viewpoints.

Purely from the standpoint of the war effort, however, there are even larger issues involved and the American people, who have rightfully been bewildered and disturbed by what has appeared to be a tide of defeats, have reason to take heart in the manner in which the Army is beginning to tackle the imposing transportation problem.

Crux of this new development is the recognition that the baffling transportation problems facing this nation in its world-wide war operations must be partly solved, at least, by air transport. Bombers and other fighting craft are useless without an adequate flow of supplies and in this war of numerous and quickly-shifting fronts as far away from our mainland as 11,000 miles, the

(Turn to page 22)

Airlines Take Over Vast War Job for U. S. Army Air Forces

Backlog for Defense, Mail Development Pays Off; Secrecy Clouds Magnitude of Mission

By WAYNE W. PARRISH

THE DIVIDEND long expected by the nation through the development of air mail carriers as a backlog of national defense was declared on Apr. 11 through a memorandum from Secretary of War Henry L. Stimson to the Commanding General of the Army Air Forces, Lt. Gen. H. H. Arnold, stating that "civil air transportation is of vital importance to the war effort."

The War Secretary directed that approximately 80 airplanes shall be devoted by the air carriers to the execution of missions under the direction of the Army Air Forces and to be operated and maintained by the air carriers *as organizations* under plans to be worked out with the Army Air Forces.

Because of the importance of this move in the war effort, no additional information can be released, nor can AMERICAN AVIATION comment, except in general terms, on the possible magnitude of the mission being assigned to the U. S. flag airlines.

Due to this action in the nation's fast-moving war plan program, a meeting of the War Production Board's sub-committee

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And Regular Features

The Airlines Don Their War Paint
This PCA DC-3, Like Many Others, Goes to Work for the Army

V.P.I. LIBRARY BLACKSBURG, VA.

XUM

P-47 Thunderbolt

AS, day by day, the stern lessons of aerial warfare over Europe were driven home, there formed in the minds of the men of Republic Aviation a new concept of fighter aircraft . . . of a plane which would *fly higher, fly faster* and *outfight* any other airplane in the world.

Early studies supported the view that a new Republic design, developed to incorporate highest available engine power and advanced turbo-supercharging, would provide this nation with a high-altitude fighter which, at least in this war, would have no match.

With the concurrence of Government officials, actual planning of the project was swiftly carried forward by Republic Aviation engineers. An intensive period of designing, building and testing ensued, during which valuable aid was rendered by Pratt & Whitney Aircraft division of United Aircraft Corporation, pioneers in the development of great aircraft engines. In all, an incalculable amount of human endeavor and skill was brought to bear so that our Army pilots might have a pursuit-interceptor which would be second to none.

Today the prospect of victory is brighter because of Republic Aviation's unflagging efforts and devotion to a single purpose. The premier designation in the field of high-altitude interception has been officially accorded the new and mighty Republic 2000-h.p. P-47 THUNDERBOLT, significantly described in the Harter Report of the House Committee on Military Affairs as "the most suitable aircraft of its type in the world."

This selection of the P-47 as one of the limited number of basic types of warcraft being produced under the Victory program is a crowning recognition of the soundness of Republic design and of the success of a resolute enterprise in which the Army Air Corps has shared importantly.

Now, the steady and ever-increasing output of Republic *P-47 Thunderbolts* at Republic Aviation's great plant at Farmingdale, New York, is to be augmented by companion production at other points.

To our distinguished brothers-in-production on the P-47, we of Republic Aviation cordially extend full collaboration and the aid of every facility at our command to *keep the Thunderbolts rolling.*

REPUBLIC AVIATION CORPORATION, FARMINGDALE, LONG ISLAND, NEW YORK

REPUBLIC REPUBLIC AVIATION **AVIATION**

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'Flying Furniture' Finds a Ready Market

Plywood Brings A Coalition of Industries

By GEORGE N. SHUMWAY

IT'S being fulfilled—the prediction that the aircraft and furniture industries would join forces in the production of plywood planes.

An announcement by a large aircraft manufacturer on engineering developments in the use of plywood brings out the observation that "wood parts will be produced by furniture and wood products firms, thus automatically expanding aircraft production capacity by utilizing otherwise idle existing equipment and factories."

It was Nov. 15, 1941, that AMERICAN AVIATION said on p. 18: "Woodworking establishments, with their hundreds of woodworkers, cabinet makers, pattern makers, and coach makers, could be given a place in the war effort, thus releasing large numbers of machine tool and metal workers for engine and propeller production."

Three big airframe manufacturers have revealed new developments in the use of plywood. A large Naperville, Ill., furniture maker early this month moved into the aircraft field. The business of "flying furniture" is booming.

New Developments

A summary of latest developments in the field shows that:

●1. Fairchild Engine & Airplane Corp. is preparing to fabricate "large quantities" of a new twin-engine trainer made of Duramold (See story in cols. 2 and 3).

●2. Curtiss-Wright Corp. will erect a manufacturing plant at an undisclosed location to engage in building military transport planes almost entirely of wood and materials not included in the list of military priorities.

●3. North American Aviation Inc. has effected a combination of plywood and steel in its trainers, eliminating 75%, by weight, of aluminum alloy. At the same time, NA engineers are mulling over the possibility of applying the new materials to combat types—perhaps the B-25 bomber and the Mustang fighter.

●4. Kroehler Manufacturing Co., Naperville, Ill., and Doak Aircraft Co. Inc., Hermosa Beach, Cal., have announced formation of a new organization to be known as Kroehler-Doak Aircraft Parts Division of Kroehler Manufacturing Co., for the purpose of combining resources in the production of molded plywood aircraft assemblies.

●5. The U. S. Navy gave signs of strengthened interest in all-plastic-plywood planes by accepting delivery on an Aeromold trainer manufactured by Timm Aircraft Corp., Van Nuys, Cal., for experimental tests.

North American Eliminates 75% by Weight

Will Plywood Go Into the B-25 and Mustang?

Among other developments in the industry: One firm which has long used plywood wings is planning to build a fuselage of that material. Another is reliably reported to have a contract to produce a plywood version of a large transport used by the major airlines. A third is planning a new cargo plane to be composed of considerable plywood.

Brandewiede

The projected Curtiss-Wright plane was designed by George A. Page, co-director of engineering for the corporation's Airplane Division, to transport personnel, equipment, and supplies to distant combat areas with the speed required by modern warfare. Metal will be used for construction only at points requiring extreme strength, it was reported.

The manufacturing plant will be the fifth to be operated by Curtiss-Wright's Airplane Division. G. J. Brandewiede, an executive of the division at St. Louis, has been appointed general manager of the new unit.

Experts in the design and manufacture of wood and plastic planes have been enlisted to participate in the new project. These include engineers who helped build the famous Fokker aircraft types of wood a decade ago, craftsmen who helped develop modern plywood designs, and others skilled in the forming of wood parts for aircraft design.

Although wooden structural parts are a further departure from conventional aluminum alloy than steel, North American has found the same basic structural designs can be used with wood as with metal.

"Fir, spruce, birch, and mahogany are the woods which have proved most acceptable in tests conducted thus far, although mahogany will probably be abandoned because it is becoming difficult to obtain," the North American statement indicated.

After extensive tests, North American learned that casein glues were best suited to the requirements of fastening plywood parts together.

Most NA wood assemblies are being furnished by Berkey & Gay Furniture Co. in Grand Rapids, Mich., a firm whose interest in the new aircraft market is in the hands of Allen Lockheed, formerly one of the original partners in Lockheed Aircraft Corp.

Berkey & Gay is also doing work on wing panels for Beech Aircraft Corp., Wichita, Kan. Beech is in production on a big order for twin-engine all-plywood bomber trainers. Since Beech uses the old process of steam bending, which the Army considers satisfactory for training ships, it has been able to subcontract some 85% of its work to furniture manufacturers.

Beech, which also makes the bomber trainer in metal, has found the plywood ship cheaper and easier to build, better in performance.

Nazis Use Wood

Furniture factories in central Germany are being increasingly employed as subcontractors to the aircraft industry in the making of wooden planes, according to recent statements appearing in the British press.

Doak Tests Trainer

The Kroehler-Doak combination brings together a leading furniture manufacturer and a concern which has developed a primary trainer of molded Douglas fir plywood, now going through flight tests.

Aside from the trainer, Doak has made large numbers of plywood map and flight-order cases and some thousands of antenna poles for a widely used trainer. Still in the experimental stage is a plywood wing for the trainer.

Delmar L. Kroehler and E. R. Doak, respective presidents of the concerns, state that the move will make possible the production of molded plywood assemblies in far larger quantities and with greatly increased speed. The new organization will utilize the manufacturing facilities of Kroehler and the engineering, research, and technical abilities of Doak.

Timm Aircraft's two-place, low-wing Aeromold trainer, now under the scrutiny of the Navy, recently received CAA approval for both primary and basic training. Timm also has experimental orders from metal-plane makers for ailerons, tabs, nose nacelles, and bomb doors.

Fairchild Goes South to Make Twin Trainers of Duramold

AN ORDER by the Army Air Forces for large quantities of a new twin-engine crew training plane with even the gun turrets of non-strategic Duramold, the process for molding plywood and synthetic resins into compound curves, has been revealed by J. Carlton Ward Jr., president of Fairchild Engine & Airplane Corp.

The announcement was authorized by the Air Forces, but, in view of the War Dept.'s plant protection rules, the speech was released in Washington instead of in the southern city where it was made by Ward.

There Fairchild took over an existing factory and announced plans for building a new one for large scale production of the new wooden plane.

Labor will be recruited from among war-idle hands in the neighboring furniture and textile industries and from among local trainees for a payroll eventually to number an undisclosed number of thousands. It is expected that half the force will be women.

Explaining the entry of Fairchild as the first aircraft manufacturer to go into this part of the south and the adoption of this non-strategic material for the first time in the U. S. for large scale military production, Ward said:

"If you cannot find enough skills and materials to build the product you need, and need desperately, you must adopt your product to the skills and materials you can find."

XUM

AEROBATICS . . . cross-country . . . formation flying . . . they're all in the day's work for the new Fleetwings basic trainer which is being built for training our Army's flying cadets.

Sturdy, maneuverable, *air-worthy*, the BT-12 handles like a thoroughbred. Powered by a 450 H.P. radial engine . . . the world's first military airplane built principally of stainless steel.

Fleetwings engineers . . . who designed and are constructing the BT-12 in quantity . . . have a long record of successful pioneering. They have developed new spot welding methods, a new straight-line-flow system for mass production, new designs, aircraft surfaces and hydraulic equipment.

Today, Fleetwings helps *get* 'em flying by pushing production to record levels, both in quantity and quality. At the same time, Fleetwings points toward bigger, tougher, fleeter warplanes tomorrow . . . shaping wings for the day of Victory!

★

FLEETWINGS

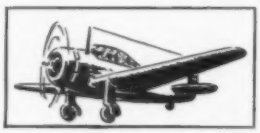
Incorporated

BRISTOL • PENNSYLVANIA

FLEETWINGS
pioneers with parts and hydraulic equipment

NEW SUB-CONTRACTS: Fleetwings has recently taken on several additional sub-contracts . . . to speed "National Offense." For instance, Fleetwings is now turning out *wings* for a fast torpedo bomber, and *tail assemblies* for one of Uncle Sam's deadliest dive bombers.

MASS PRODUCTION of aircraft control surfaces is now ancient history at Fleetwings. Man-hours per set of control surfaces was again recently reduced 14% . . . thus increasing output . . . that is typical of records that are being set by Fleetwings' production workers. Every department in the plant continues to keep ahead of schedule . . . making 'em better and faster, whether they're huge wings and rudders for multi-motored bombers or hydraulic valves and jacks.



FAST WORKERS: One of the many reasons why Fleetwings can keep production ahead of schedule is that each employee's job has been simplified to an extreme—reduced to one or two operations. Another reason is that the Fleetwings Vocational School has already graduated about 1000 men . . . and these graduates are now helping to build warplanes and parts faster. Many women, too, are taking Fleetwings' *free* training course. And they also are making good.

"KEEP 'EM FLYING!"

FLEETWINGS
Incorporated
BRISTOL • PENNSYLVANIA

5 New Air Forces Schools OK'd Raising Total to 20

THE WAR Dept. has announced the authorization of five more construction contracts for Army Air Forces schools to be established at Hobbs, N. M.; Sioux Falls, S. D.; Buckley Field, near Denver, Col.; Berry Hill Field, near Nashville, Tenn.; and one located in Lawrence County, Ill., each to cost more than $5,000,000 and raising the construction program to the grand total of 20 schools costing in excess of $100,000,000.

Texas continues to lead in the number of sites chosen with nine schools being constructed at Amarillo, Big Spring, Eagle Pass, Greensville, Hondo, Lubbock, Pecos, San Angelo, and Waco.

New Mexico has now moved into second place with Florida, each state having two sites chosen for schools. Appalachicola and Marinna are the two Florida locations and Carlsbad and Hobbs the sites chosen in New Mexico. Blytheville, Ark.; Denver, Col.; Lawrence County, Ill.; Monroe, La.; Sioux Falls, S. D.; Nashville, Tenn.; and Madison, Wis., complete the list of new Air Forces schools.

Loans for Training

A nation-wide student loan program to train civilian men and women in aviation production and maintenance has been established under sponsorship of the Embry-Riddle School of Aviation of Miami, Fla., and the Morris Plan Bank of Virginia.

The Bank will act as a clearing house for all other participating Morris Plan banks. Loans for tuition, room and board will cost 6% per $100, plus $1 for life insurance. Installment re-paying does not commence until 45 days after graduation.

Jack S. Hunt, former flight director, has been named general manager of Riddle Aeronautical Institute.

Accident Board Formed

C. C. Moseley, president of Cal-Aero, Mira Loma, Polaris, and Curtiss-Wright Tech, announces formation of an Accident Education Board at each of the schools to investigate flying accidents. After determining the circumstances which surround each accident, the board will make reports with suggestions for safer operation in the future.

"The purpose of the board is not to place blame on anyone for mistakes, but to eliminate accidents by education," Moseley said.

Cal-Aero Academy, Ontario, Cal., was mentioned recently in a War Dept. report as holding the No. 1 safety record for schools throughout the country last year.

Casey Jones in Newark: These are the buildings in Newark, N. J., occupied by Casey Jones School of Aeronautics, of which C. S. "Casey" Jones is president. Courses in aeronautical engineering and master mechanics are offered at this location. The organization has recently expanded to other buildings in Newark.

Casey Jones in Jackson Heights: The Academy of Aeronautics Inc., of which C. S. "Casey" Jones is president, is located at New York Municipal Airport, Jackson Heights, L. I. Courses in aircraft mechanics and maintenance and airplane design are offered at this location. The Academy is designated as an Air Corps Training Detachment.

CAP Credited With Successful Anti-Submarine Work in Atlantic

CIVIL AIR Patrol special "task forces" established to supplement the anti-submarine work of the Army and Navy along the East Coast have already figured prominently in the destruction of several Axis U-boats, according to word received from the Air Forces Eastern Defense Command, headquartered at Mitchel Field, N. Y.

While neither the number nor the location of the CAP task forces can be disclosed for military reasons, the Eastern Defense Command reveals that "the flying minute men, carrying out missions directed by the Support Command of the First Air Force in many types of civilian aircraft, have spotted enemy submarines and survivors of torpedoed ships."

Further, it was stated that "on several occasions enemy submarines about to attack tankers carrying oil to America's overseas forces have dived in fright without releasing their torpedoes on approach of CAP planes. Several sinkings scored by Army and Navy bombers are credited directly to a tip-off by civilian volunteers assigned to patrol work in certain Atlantic areas off the U. S."

As a result of collaboration between CAP units and the Coast Guard, work of ore boats and other ships carrying vital cargoes along the Atlantic seaboard has been speeded up and made safer.

Courier Service

In the course of an experiment likely to be continued and expanded, the CAP has been conducting a courier service for the Air Forces throughout the eastern states, thereby releasing regular Army pilots and planes for more important military duties.

During the first 20 days of operation, five CAP planes of the Pennsylvania Wing flew 2,277,000 pound-miles of cargo between numerous points from Maine to Florida in 270 hours of flying time. The cargo consisted of Army equipment and supplies needed at Air Forces bases.

The five CAP planes engaged in the work are based at the Harrisburg, Pa., airport and include one 165-hp. Cessna, one 220-hp. Waco, one 90-hp. Stinson, and two Piper Cubs of 75 hp. and 65 hp. each. The smaller planes are used for short flights with light loads, while the higher-powered craft are used for distant trips with loads up to several hundred pounds.

The volunteer pilots performing specific missions for the government receive operating expenses for their planes, according to hours of use and amount of horsepower, and an additional stipend for personal living expenses.

40,000 Members

Enlistments in the CAP are now past the 40,000 mark, with about 80% of the total being pilots. More than 36,000 service records have been cleared through the Federal Bureau of Investigation in Washington and sent back to Wing Commanders.

The Eastern Defense Command's statement on CAP's anti-submarine patrol indicated that Earle L. Johnson, national commander of the CAP, has been commissioned in the Army with rank of captain.

Price Increase

Effective June 1, the single copy price of AMERICAN AVIATION will be 20c. There will be no change in subscription rates.

Piper Offers Modelers Chance to Work and Fly

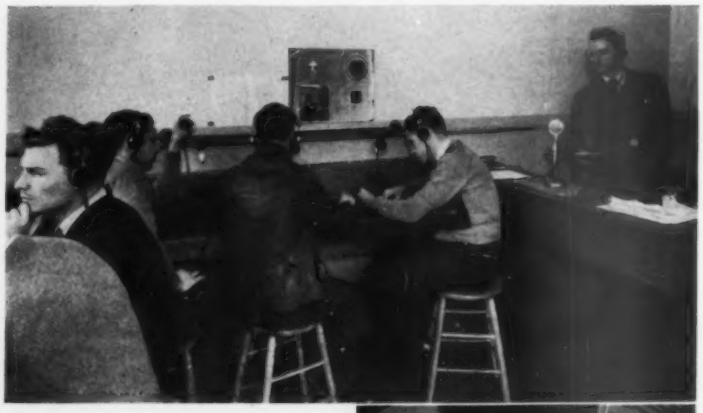
YOUTHFUL model plane builders of both sexes will be given a chance to win flying time and employment through their modeling skill, in a nationwide "Piper Wings for Youth Competition" to be sponsored by Piper Aircraft Corp., of Lock Haven, Pa.

Prizes for the best built scale models of the Piper Cub Trainer will consist of more than 100 Piper Aeronautical Scholarships providing employment for one year at the Piper plant at regular salary and, in addition, 100 hours of flying time free at the company's airport. Other winners will receive one-hour test flights under instructors of local Piper dealers.

Total monetary value of the prizes will exceed $100,000.

The competition will be divided into age groups of 12-15, inclusive, and 16-19, inclusive, with the former receiving the one-hour test flights, and the latter eligible for the employment and training scholarships.

NEA Trains First 'Flight Officers'



THE PILOT training division of Northeast Airlines late last month turned out the first group of CPTP pilots specially trained for commercial service overseas. The eight graduating pilots were rated as flight officers—a new designation for men who complete the nine weeks training which in peacetime would fit them for co-pilot positions with airlines.

The flight officers course provides instruction in complexities of airline procedures, including six weeks of advanced meteorology, navigation, radio and instrument flight practice.

NEA's pilot training school, the first of its kind in the country, will train a total of 184 flight officers at its new Burlington, Vt., headquarters. There are now 80 students actively enrolled for the course, and these will be taken in at the rate of eight weekly and graduated at the same speed.

The training staff of the school will include 28 flight instructors and 30 ground technicians. A fleet of 11 planes is presently maintained for flight instruction, four being multi-engine transports.

Student flight officers, in the accompanying pictures, are shown with instructors in the NEA school's communications quarters and aboard one of the multi-engine flying classrooms.

Spring CPT Program Uses Fleet of 3,518 Planes, CAA Reveals

CIVIL contractors taking part in the Civilian Pilot Training Program's spring session are using an aggregate training fleet of 3,518 planes, valued at $12,000,000, according to figures compiled by the Civil Aeronautics Administration.

All of these planes are property of the civilian operators giving instruction at more than 700 training centers, and all, except about $70,000 worth, represent new purchases since start of CPTP in 1939.

In the elementary phase of the program, 2,621 lightplanes of 11 different makes are in use. These are the least expensive types, usually costing about $1,700 each, most of them with tandem seating arrangement.

Higher power craft used in secondary instruction average about $8,000 each, and are open-cockpit type.

In the cross-country and instructors' courses, closed cabin planes of four and five seating capacity are used, costing from $10,000 to $20,000 each.

No estimates are yet available on the amount of new equipment which will be required under present plans for expanding CAA training activities to give preliminary instruction to pilots for the Army Air Forces.

Aero Education Unit Formed at Columbia

A SPECIAL aviation education research project has been established at Teachers College, Columbia University, New York, N. Y., under the auspices of the Civil Aeronautics Administration, to introduce aviation courses and concepts in elementary and secondary schools throughout the country.

Members of the research committee are Dr. N. L. Engelhardt, director, Dr. Paul R. Mort, George T. Renner, and Ben D. Wood.

These men will arrange to provide teachers with manuals for classroom work, texts, maps, and other material to institute the aviation education program next fall.

T. J. McGill Joins American Aviation

T. J. McGILL has joined American Aviation Associates as advertising manager, succeeding Lt. John L. Foy, now on active duty with the Navy's air transport service.

Educated at St. Mary's College, Superior State Teachers College, and George Washington University, McGill was with the U. S. Government from 1935 to 1937, first with NRA, then with National Bituminous Coal Commission, WPA, Sen. La-Follette's Civil Liberties Committee, and later back with the Coal Commission.

He then joined Western Adjustment Co. and was later employed by Fuller & Smith & Ross, Cleveland advertising agency, as director of research and account executive.

They ask No Odds...

ON all fronts, often against overwhelming odds, the fighting qualities of the Curtiss Hawk have become legend. Now, in the most recent addition to this notable P-40 Series, past performance records are surpassed for the formidable task ahead.

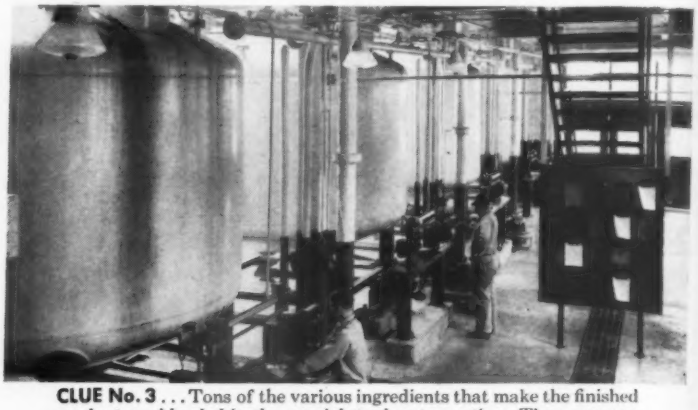
CURTISS *Electric*
PROPELLERS

Can you identify this industry?

(IT HELPS GIVE EXTRA POWER TO AMERICA'S WARPLANES)

CLUE No. 1... The basic raw materials used are—salt, sulphur, sea water, molasses, lead and petroleum gas. This picture shows part of the equipment for evaporating salt brines to produce table salt.

CLUE No. 2... The battery of compressors above is used to compress petroleum gases in making ethyl chloride. This particular chemical is very necessary — but there is not a drop of it in the finished product.



CLUE No. 3... Tons of the various ingredients that make the finished product are blended in these weigh tanks at one time. They measure the ingredients accurately to within one part in ten thousand.

CLUE No. 4... This research engineer is using an optical pyrometer to tell, by color, the temperature of an exhaust valve in an engine running "wide open." Research is very important in this industry.

CLUE No. 5... Painting a drum to ship the product overseas for war use. Each drum is cleaned and painted gray each time used, so the least leak of brightly colored product would show immediately.

CLUE No. 6... The final clue is an easy one—if you're an automotive or petroleum engineer. These machines are "C. F. R." knock rating engines which are used in the six gasoline-testing laboratories.

It's probably no secret to you by now—these are a few pictures of the company that produces Ethyl brand of anti-knock fluid. Oil refiners use Ethyl fluid to produce the high-octane gasolines that give extra power to America's warplanes, tanks and other motorized equipment. Fortunately, The Ethyl Corporation has sufficient plant capacity to supply all war needs without delay and still produce anti-knock fluids for improving gasoline used in the tractors, trucks, buses and passenger cars of our motor transportation system.

XUM

Moved Lately?

In order to prevent delay in the receipt of your copy of AMERICAN AVIATION, please notify us promptly of change of address. If possible, send notification 15 days in advance of effective date of change. Such notice should include the former as well as the new address.

Firm Completes Cuban Aerial Mapping Survey

ABRAMS Aerial Survey Corp., Lansing, Mich., late last month completed an extensive air mapping project over the island of Cuba—the third major Caribbean aerial survey conducted by the firm's airmen since 1936.

Leo Crossman of Marion, Ind., and Elmore Kerkela of Minneapolis, Minn., functioned as pilot and cameraman, respectively, making the four-month Cuban survey in a Beechcraft cabin plane.

The aerial surveying firm conducted a complete mapping of Puerto Rico for the U. S. Army Corps of Engineers in 1936, preparatory to the vast defense construction there, and followed this up last year with aerial mapping of the Dominican Republic.

Defers Liability Study

The CAB has postponed indefinitely consideration of the aviation liability legislation problem which has been under investigation by its staff.

In June 1941, Edward C. Sweeney, CAB attorney (now on active duty with the Navy), submitted a report to CAB on proposed legislation. Comments were requested, and although some have been received, CAB said that response has been retarded by the war.

"In view of these circumstances and because of the press of its other business more directly related to the war effort, the Board feels that it should not give consideration to the problem . . . at the present time," the announcement said.

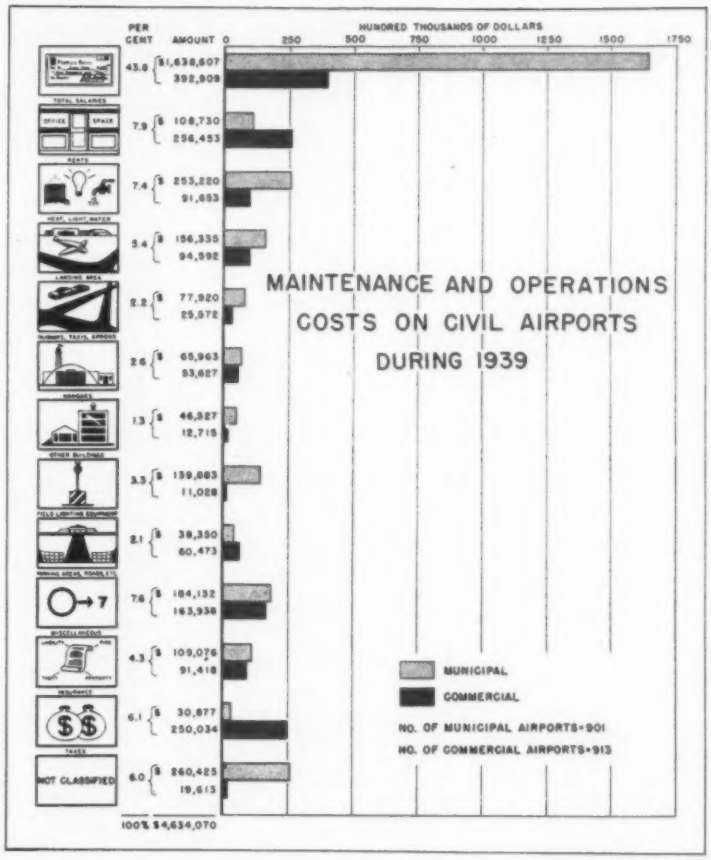
Navy School Head Named

Capt. David C. Hanrahan, 66, World War I flyer and until recently Naval Observer in London, has been designated commanding officer of the new Naval Pre-Flight Training School at the University of Iowa.

The Iowa training school at Iowa City was commissioned Apr. 15 and is the first of four university training centers to be put into operation under one phase of the Navy's new aviation training program.

Rising Tempo

The accelerating tempo of the nation's war effort was typified by Oklahoma Flying School with graduation of the latest basic training class of pilots one week ahead of schedule, after eight weeks' instruction.



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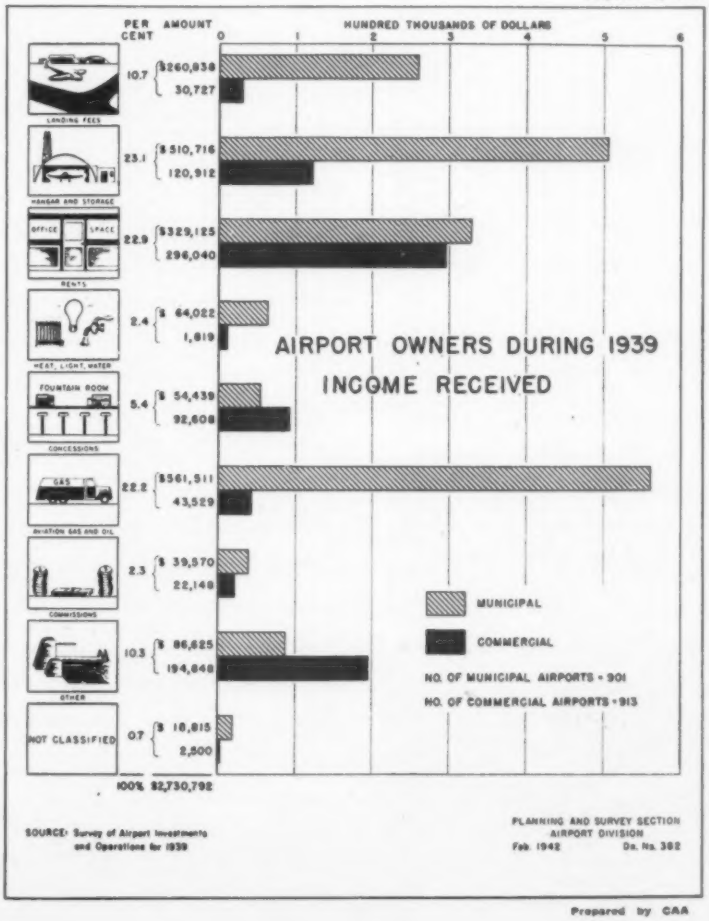

PER CENT
AMOUNT
HUNDRED THOUSANDS OF DOLLARS
0 1 2 3 4 5 6
AIRPORT OWNERS DURING 1939
INCOME RECEIVED
LANDING FEES 10.7 $260,938 30,727
HANGAR AND STORAGE 23.1 $ 510,716 120,912
OFFICE SPACE RENTS 22.9 $329,125 296,040
HEAT, LIGHT, WATER 2.4 $ 64,022 1,819
FOUNTAIN ROOM CONCESSIONS 5.4 $ 54,439 92,608
GAS AVIATION GAS AND OIL 22.2 $561,511 43,529
COMMISSIONS 2.3 $ 39,570 22,148
OTHER 10.3 $ 86,625 194,648
NOT CLASSIFIED 0.7 $ 18,815 2,500
100% $2,730,792
MUNICIPAL
COMMERCIAL
NO. OF MUNICIPAL AIRPORTS = 901
NO. OF COMMERCIAL AIRPORTS = 913
SOURCE: Survey of Airport Investments and Operations for 1939
PLANNING AND SURVEY SECTION
AIRPORT DIVISION
Feb. 1942 Dr. No. 382

Prepared by CAA

Rep. Randolph Wants Aviation Courses in All U.S. High Schools

REP. RANDOLPH (D., W. Va.) hopes to see aviation courses introduced in high schools throughout the country by next fall.

He has been successful in effecting legislation providing for aviation courses in secondary schools in the District of Columbia. As a result of his bill, approved last December, 300 students in District high schools have received aviation training this semester (in eight white and three colored schools). By popular demand, Randolph says, an intensive summer course will be offered.

J. W. Studebaker, U. S. Commissioner of Education, has made public a proposed plan for aviation training in secondary schools. If this plan does not materialize, Randolph intends to introduce legislation which will provide for the training.

Army Contract to AITI

Contracts for large-scale training of hundreds of especially selected men of U. S. Army Air Corps Air Service Command have been awarded to Aero Industries Technical Institute, Los Angeles, Cal., as announced by James L. McKinley, managing director of the school. At the completion of the training, which will include specialized phases of aircraft and engine maintenance, the mechanics will serve at Air Corps maintenance depots and stations.

Addition of the Army group to the school's civilian engineering and mechanics student section will approximately double the enrollment.

CAA Warns Pilots of Balloon Hazard

With the notification that balloon barrages are now being operated at certain vital areas, the CAA has warned civilian pilots to use "extreme caution" in making flights into, through, or in the vicinity of such barrages. Prior to departure of a flight into a balloon-defended area, all pilots are instructed to obtain the latest detailed information regarding the operation of the barrages.

Particular attention is called to the situation at Boeing Field, Seattle, Wash., which is protected by a balloon barrage flown daily from about an hour before sunset to an hour after sunrise. During daylight hours, when it is known that no enemy planes are within 100 miles of the field, the balloons which obstruct landing and take-off on the main runway are grounded to permit airline, test and ferry flights.

XUM

Official Data on Enemy Aircraft Revealed

Unusual Release Analyzes Axis Combat Planes

FIRST official descriptions and authoritative performance figures of more than 50 types of combat aircraft now in use by Japan, Germany, and Italy have been made available to the people of the United Nations by the U. S. Army Air Forces and the British Air Ministry.

Although there have been innumerable volumes of speculative material printed on the subject of enemy aircraft, heretofore there has been nothing released which compares with the unusual official joint U. S.-British summary.

One War Dept. official pointed out, "We had to be positive our information was correct before we released it for critical consumption by our people."

Of the 31 Japanese combat types listed below, nine are Army and Navy fighter planes whose chief characteristics include comparative lightness in weight and engines of comparatively low horsepower. Protective armor for personnel is lacking in almost every case. Armament consists generally of 7.7 mm. machine guns, approximately the same as the American and British .30 caliber. The occasional use of a 20 mm. cannon is noted.

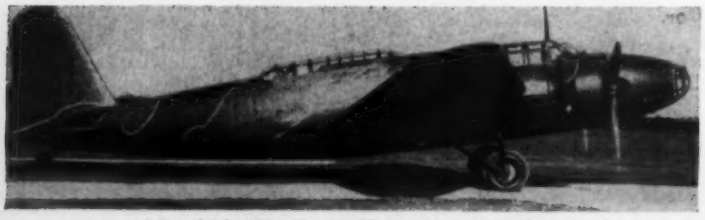
Succeeding issues of AMERICAN AVIATION will carry specifications of German and Italian warcraft, as contained in the official release.

Description of the Japanese planes follows:

Japanese Warplanes

TYPE	MITSUBISHI T98 (Mitsu 106) Army Bomber.
DIMENSIONS	Span 75 ft. Length 59 ft. Wing area 685 sq. ft.
DUTY	Bombing. Reconnaissance.
CREW	4-5.
GENERAL DESCRIPTION	Developed from Mitsubishi T93 Army bomber. Twin engine, low-wing monoplane with retractable under-carriage. Wings with rounded tips and root-fillets, twin-rudder braced tail unit, rudders and fins of angular shape, set between fuselage and tips of tailplane. Metal construction. Fuselage of rectangular cross-section with rounded top surface, perspex covered cockpit over central section and large spherical gun turret in nose. Probable dorsal gun position in open cockpit over wing root fillets.
ENGINES	Two Mitsubishi air-cooled radials of 750 h.p. at 15,000 ft. Long-chord engine cowlings are fitted and the crankcase cowlings are adjustable.
AIRSCREWS	2 blade metal.
ARMAMENT	1 x 20 mm. free forward fuselage. 2 x 7.7 mm. fixed forward wings. 2 x 7.7 mm. free dorsal.
PERFORMANCE	Normal weight 21,000 lb. Maximum speed 220 m.p.h. at 15,000 ft. Service ceiling 23,000 ft. Cruising speed 185 m.p.h. with a range of 1,180 miles or 6.4 hours carrying 2,200 lb. bombs and 480 gallons.

TYPE	MITSUBISHI T97 Army Bomber. (Pictured below).
DIMENSIONS	Span 73 ft. Length 62 ft. Wing area 675 sq. ft.
DUTY	Bombing. Reconnaissance.
CREW	5-7.
GENERAL DESCRIPTION	Twin-engine, low-mid-wing monoplane with retractable undercarriage. Tapered wings with rounded tips and split flaps. Wing root fillets. Single fin with rounded tip and nearly vertical rudder trailing edge. Metal, stressed-skin construction. Well streamlined fuselage, with perspex nose. Tail of fuselage tapers to cone, which may contain a fixed M.G. in some instances. Dorsal cockpit over trailing edge of wing.
ENGINES	Two Kinsei 14-cyl. air-cooled radials of 870 h.p. at 10,000 ft.
AIRSCREWS	3-blade v.p. metal.
ARMAMENT	2 x 7.7 mm. free forward fuselage. 2 x 7.7 mm. free dorsal turret. 2 x 7.7 mm. free lateral. 1 x 7.7 mm. fixed in tail-cone.
PERFORMANCE	Normal weight 22,000 lb. Max. speed about 220 m.p.h. at 10,000 ft. Service ceiling 22,000 ft. Cruising speed 190 m.p.h. with a range of 1,180 miles, or 6.2 hours, carrying 4,400 lb. bombs and 540 gallons.
MAXIMUM TANKAGE	810 gallons.



Mitsubishi T97 Seven-Place Army Bomber

With Two 870-hp. Engines, Retractable Gear

TYPE	KAWASAKI T97 (Mitsu 97) Army Fighter.
DIMENSIONS	Span 36 ft. Length 24 ft. Wing Area 141 sq. ft.
DUTY	Fighting. Ground-attack.
CREW	1
GENERAL DESCRIPTION	Of Mitsubishi design, single-engine low-wing monoplane with fixed single-leg type undercarriage. Fuselage of oval cross section, metal construction. Spatted wheels.
ENGINES	One Kawasaki 102 14 cyl. air-cooled radial of 850 h.p. at 13,000 ft.
AIRSCREW	V.P.
ARMAMENT	1 x 7.7 mm. fixed forward fuselage. 2 x 7.7 mm. fixed forward wings. 1 x 7.7 mm. moveable dorsal.
PERFORMANCE	Normal weight 4600 lb. Maximum speed 290 m.p.h. at 15,000 ft. Service ceiling 32,000 ft. Cruising speed 255 m.p.h. with a range of 335 miles, or 1.31 hours on 67 gallons.
MAXIMUM TANKAGE	134 gallons.

TYPE	MITSUBISHI T97 Army Fighter.
DIMENSIONS	Span 36 ft. Length 24 ft. Wing Area 140 sq. ft.
DUTY	Fighting. Ground-attack.
CREW	1
GENERAL DESCRIPTION	Also produced by Kawasaki, single engine low-wing monoplane with fixed single-leg type undercarriage. Fuselage of oval cross section metal construction. Spatted wheels.
ENGINES	One Mitsu 109 air cooled radial of 650 h.p. at 11,500 ft.
AIRSCREW	Fixed pitch 2 blade.
ARMAMENT	4 x 7.7 mm. probably 3 forward and 1 dorsal, all fixed.
PERFORMANCE	Normal weight 4,400 lb. Maximum speed 265 m.p.h. at 13,000 ft. Service ceiling 29,000 ft. Cruising speed 230 m.p.h. with a range of 375 miles, or 1.63 hours, on 60 gallons.
MAXIMUM TANKAGE	126 gallons.

TYPE	NAKAJIMA T97 Army fighter. (Picture on page 12).
DIMENSIONS	Span 36 ft. Length 24 ft. Wing Area 140 sq. ft.
DUTY	Fighting. Ground-attack.
CREW	1
GENERAL DESCRIPTION	Also produced by Kawasaki, single engine low wing monoplane with fixed single-leg type undercarriage. Fuselage of oval section, metal stressed-skin construction. Wings with rounded tips, large tail fin with rounded tip and rounded rudder trailing edge. Spatted wheels.
ENGINES	One Hikari 9 cyl. air-cooled radial of 800 h.p. at 15,000 ft.
AIRSCREW	2 blade fixed pitch.
ARMAMENT	2 x 7.7 mm. fixed forward fuselage.
PERFORMANCE	Normal weight 4,400 lb. Maximum speed 270 m.p.h. at 15,000 ft. Service ceiling 33,000 ft. Cruising speed 234 m.p.h. with a range of 340 miles, or 1.45 hours, on 67 gallons.
MAXIMUM TANKAGE	134 gallons.

TYPE	KAWASAKI T98 (Kawa 102) Army Fighter.
DIMENSIONS	Span 29 ft. Length 23 ft. Wing area 236 sq. ft.
DUTY	Fighting. Ground-attack.
CREW	1
GENERAL DESCRIPTION	Single engine biplane with split axle type of undercarriage. Staggered, braced wings of unequal span. Mainly of metal construction. Rounded tail fin and rudder, braced tailplane.
ENGINES	One Kawasaki of 820 h.p. at 10,000 ft.
AIRSCREW	3 blade.
ARMAMENT	2 x 7.7 mm. fixed forward fuselage. 2 x 20 mm. fixed forward wings.
PERFORMANCE	Normal weight 5,000 lb. Maximum speed 270 m.p.h. at 10,000 ft. Service ceiling 32,000 ft. Range probably 350 to 400 miles.

TYPE	KAWASAKI T97 (Kawa 95) Army Bomber.
DIMENSIONS	Span 75 ft. Length 62 ft. Wing area 665 sq. ft.
DUTY	Bombing. Reconnaissance.
CREW	5-7.
GENERAL DESCRIPTION	Twin-engine, low wing monoplane with retractable undercarriage. Wings have a slight dihedral and taper to rounded tips, flaps fitted. Long perspex-covered cockpit over centre section and transparent nose. Single-fin tail unit. Retractable tail wheel.
ENGINES	Two Kawasaki 98 air cooled radials of 820 h.p.
AIRSCREWS	3 blade.
ARMAMENT	2 x 25 mm. and 1 x 7.7 mm. forward fuselage. 2 x 7.7 mm. moveable dorsal. 1 x 7.7 mm. moveable ventral.
PERFORMANCE	Normal weight 20,900 lb. Maximum speed 245 m.p.h. at 15,000 ft. Service ceiling 24,500 ft. Cruising speed 210 m.p.h. with a range of 240 miles, or 1.15 hours, carrying 4,400 lb. bombs and 167 gallons. Alternatively 1,250 miles, or 6 hours, carrying 1,100 lb. bombs and 510 gallons.

TYPE	MITSUBISHI T98 Army Light Bomber-Recco.
DIMENSIONS	Span 39.5 ft. Length 27.9 ft. Wing area 258 sq. ft.
DUTY	Bombing. Reconnaissance.
CREW	2
GENERAL DESCRIPTION	Similar in appearance to the "Karigane" Mark II. Single-engine, low-wing monoplane with fixed cantilever undercarriage. Cantilever wing and tail surfaces, of moderate taper. Fitted flaps. Large root fillet. Stressed-skin metal fuselage.
ENGINES	One Kinsei 14-cyl. 2 row air-cooled radial of 900 h.p. at 10,000 ft.
ARMAMENT	2 x 7.7 mm. fixed forward wings. 1 x 7.7 mm. free dorsal.
PERFORMANCE	Maximum speed estimated 240 m.p.h. to 260 m.p.h. Cruising speed estimated 200 m.p.h. Normal bomb load 650 lb., maximum 1,000 lb.

(Continued on page 12)

LANDING FIELD 60×60!

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CONTRACTORS TO THE UNITED STATES GOVERNMENT

Official U. S. - British Data on Jap Warplanes

(Continued from page 10)

TYPE	NAKAJIMA T94 Army Reconnaissance.
DIMENSIONS	Span 39.5 ft. Length 26.2 ft. Wing area 323 sq. ft.
DUTY	Army Co-op. Recco. Bombing.
CREW	2
GENERAL DESCRIPTION	Single-engine bi-plane with fixed split undercarriage of wide track. Wings elliptical in plan form and of unequal span. Interplane struts of "N" formation slope sharply. Fabric covered structure. Open cockpits.
ENGINES	One Kotobuki aircooled radial of 600 h.p. at 11.000 ft.
AIRSCREW	2-blade, fixed pitch, metal.
ARMAMENT	1 x 7.7 mm. fixed forward fuselage. 1 x 7.7 mm. free dorsal.
PERFORMANCE	Normal weight 5.720 lb. Maximum speed 175 m.p.h. at 13.000 ft. Service ceiling 23.000 ft. Cruising speed 150 m.p.h. with a range of 470 miles or 3.1 hours on 104 gallons.

TYPE	MITSUBISHI T97 Army Light Bomber-Recco.
DIMENSIONS	Span 40 ft. Length 27 ft. Wing area 215 sq. ft.
DUTY	Bombing. Reconnaissance.
CREW	2
GENERAL DESCRIPTION	A single-engine, low wing monoplane with single leg non-retractable undercarriage and spatted wheels. Tapered wing with rounded tips and split flaps. Metal, stressed-skin construction, but control surfaces are fabric-covered. The cockpit fairing extends into the tail fin. Single rudder and cantilever tail unit.
ENGINES	One Kotobuki air-cooled radial of 800 h.p.
AIRSCREWS	2 blade metal.
ARMAMENT	2 x 7.7 mm. fixed forward fuselage. 1 or 2 x 7.7 mm. free dorsal.
PERFORMANCE	Normal weight 5.750 lb. Maximum speed 260 m.p.h. at 15.000 ft. Cruising speed about 220 m.p.h. with a range of 960 miles, or 4.25 hours, on 180 gallons. Alternatively with bombs in place of fuel, 450 miles, carrying 660 lb. bombs and 100 gallons.

TYPE	MITSUBISHI T97 (Mitsu 103) Army Light Bomber-Recco.
DIMENSIONS	Span 47.7 ft. Length 34 ft. Wing area 295 sq. ft.
DUTY	Bombing. Reconnaissance.
CREW	2-3.
GENERAL DESCRIPTION	Single engine, low wing monoplane with single-leg fixed undercarriage. Metal construction.
ENGINES	One Mitsubishi 14 cyl. air-cooled radial of 900 h.p. at 12.000 ft.
AIRSCREWS	2 blade metal v.p. of Hamilton type.
ARMAMENT	1 or 2 x 7.7 mm. fixed forward fuselage. 1 x 7.7 mm. moveable dorsal.
PERFORMANCE	Normal weight 8.000 lb. Maximum speed 260 m.p.h. at 13.000 ft. Service ceiling 27.000 ft. Cruising speed 210 m.p.h. with a range of 750 miles, or 3.3 hours, carrying 660 lb. bombs and 168 gallons. With 1.000 lb. bombs and 130 gallons range is 500 miles.

TYPE	AICHI T98 (Aichi 104) Navy Flying boat .
DIMENSIONS	Span 49.2 ft. Length 36.1 ft. Wing area 160 sq. ft.
DUTY	Reconnaissance. Probably spotting.
CREW	3.
GENERAL DESCRIPTION	Single engine, biplane.
ENGINES	One type "9" of about 500 h.p. at S.L.
AIRSCREWS	Not known.
ARMAMENT	1 x 7.7 mm. free forward fuselage only installation known.
PERFORMANCE	Not known, probably of the order of 121 m.p.h. Maximum speed at S. L., and about 80 m.p.h. cruising with a range of 1.100 miles or 14 hours.

TYPE	KAWASAKI T95 Army Fighter. (Pictured below).
DIMENSIONS	Span 32.8 ft. Length 26.2 ft. Wing Area 230 sq. ft.
DUTY	Fighting, ground-attack.
CREW	1
GENERAL DESCRIPTION	Modified version of obsolete T92, single-engine biplane with split axle undercarriage. Wings of unequal span, top wing carried above fuselage on "N" struts, outer panels braced by "N" struts. Fuselage straight-sided with rounded top, apparently metal covered. Open cockpit.
ENGINES	1 Kawasaki 12 cyl. "V" liquid-cooled of 800 h.p. at 11.500 ft.
AIRSCREW	3 bladed metal.
ARMAMENT	3 x 7.7 mm. fixed forward fuselage.
PERFORMANCE	Normal weight 4.000 lb. Maximum speed 250 m.p.h. at 13.000 ft. Service ceiling 33.000 ft. Cruising speed 210 m.p.h. with a range of 300 miles, or 1.4 hrs., on 65 gallons.

Kawasaki T95 800-hp. Army Fighter

A Modified Version of the Obsolete T92 Biplane

Nakajima 96 Navy Pursuit
Single Seat, Low Wing

Nakajima 97 Army Fighter
Single Seat, Fixed Undercarriage

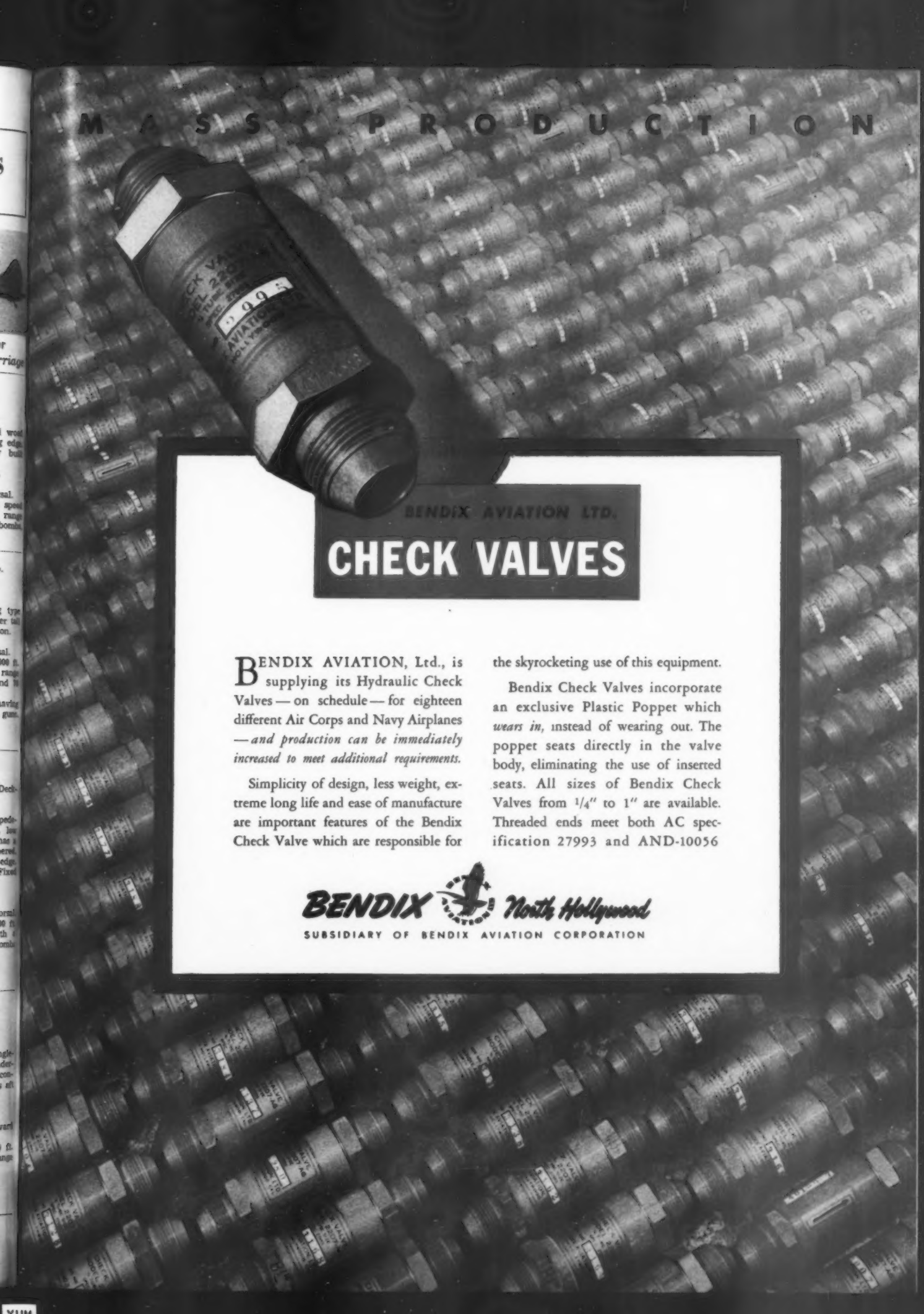
TYPE	KAWANISHI T94 Navy Reconnaissance.
DUTY	Reconnaissance. Spotting. Seaplane.
DIMENSIONS	Span 46 ft. Length 34 ft. Wing area 530 sq. ft.
CREW	3.
GENERAL DESCRIPTION	Single-engine, twin-float biplane. Wings of equal span and wood construction, monoplane tail, rudder with straight trailing edge. Fuselage of roughly rectangular cross-section probably built up of metal tubes, fabric-covered.
ENGINES	One Hiro "91" 12-cyl. "W" liquid-cooled of 600 h.p. at S.L.
AIRSCREW	2 or 4 blade wooden fixed-pitch.
ARMAMENT	1 x 7.7 mm. fixed forward fuselage. 1 x 7.7 mm. free dorsal.
PERFORMANCE	Normal weight 6.100 lb. Service ceiling 18.000 ft. Maximum speed 140 m.p.h. at 5.000 ft. Cruising speed 120 m.p.h. with a range of 550 miles, or 4.6 hours, on 120 gallons, or with 500 lb. bombs, a range of 530 miles.

TYPE	MITSUBISHI T98 (Mitsu 104) Army Light Bomber-Recco.
DIMENSIONS	Span 46 ft. Length 26.2 ft. Wing area 290 sq. ft.
DUTY	Bombing. Reconnaissance.
CREW	2-3.
GENERAL DESCRIPTION	Single engine, low wing monoplane with fixed single-leg type undercarriage. Small wing root fillets. Split flaps. Cantilever tail unit of triangular shape. Perspex cockpit. Metal construction.
ENGINES	One Mitsubishi air-cooled radial of 900 h.p. at 9.000 ft.
ARMAMENT	2 x 7.7 mm. fixed forward fuselage. 1 x 7.7 mm. free dorsal.
PERFORMANCE	Normal weight 7.800 lb. Maximum speed 250 m.p.h. at 11.000 ft. Service ceiling 25.000 ft. Cruising speed 208 m.p.h. with a range of 280 miles or 1.24 hours, carrying 1.230 lb. bombs and 70 gallons.
REMARKS	There is a reported version with alternative armament having 2 x 20 mm. guns in the wings and 2 x 7.7 mm. free dorsal guns.
MAXIMUM TANKAGE	140 gallons.

TYPE	MITSUBISHI T 97/1 Navy Torpedo Bomber.
DIMENSIONS	Span 50.8 ft. Length 33.9 ft. Wing area 375. sq. ft.
DUTY	Bombing. Torpedo-dropping. Possibly reconnaissance. Deck-landing.
CREW	2-3.
GENERAL DESCRIPTION	A similar aircraft was built by Nakajima as the T97/2 torpedo-bomber with Hikari "3" 700 h.p. engine. Single-engine, low wing monoplane with a retractable undercarriage. Wing has a pronounced taper and long wing-root fillets, tail plane tapered, fin with rounded tip and rudder has rounded trailing edge. Long covered cockpit, with hinged cover for dorsal gun. Fixed tail wheel.
ENGINES	One Kinsei air-cooled radial of 900 h.p. at 10.000 ft.
AIRSCREW	3 blade Hamilton type metal.
ARMAMENT	1 x 7.7 mm. fixed forward fuselage. 1 or 2 x 7.7 mm. free dorsal.
PERFORMANCE	Normal weight 8.500 lb. Maximum speed 195 m.p.h. at 10.000 ft. Service ceiling 23.000 ft. Cruising speed 167 m.p.h. with a range of 470 miles, or 2.8 hours, carrying either 750 lb. bombs or a 1.760 lb. torpedo and 145 gallons.
MAXIMUM TANKAGE	250 gallons.

TYPE	NAKAJIMA T97 Navy Fighter.
DIMENSIONS	Span 35.5 ft. Length 25.6 ft. Wing area 160 sq. ft.
DUTY	Fighting. Deck landing.
CREW	1
GENERAL DESCRIPTION	Basic design may resemble the Mitsubishi T96 fighter. Single-engine low wing monoplane with fixed single-leg type undercarriage, fitted spats. Fuselage of stressed-skin metal construction and the fairing for the pilot's head cover extends aft to eventually become the fin.
ENGINES	One Nakajima air-cooled radial of 750 h.p. at 13.000 ft.
AIRSCREWS	3 blade metal.
ARMAMENT	1 x 7.7 mm. fixed forward fuselage. 2 x 7.7 mm. fixed forward wings.
PERFORMANCE	Normal load 4.300 lb. Maximum speed 270 m.p.h. at 15.000 ft. Service ceiling 32.000 ft. Cruising speed 233 m.p.h. with a range of 460 miles, or 1.98 hours, on 80 gallons.
MAXIMUM TANKAGE	140 gallons.
REMARKS	Provisions for camera installation.

(Continued on page 14)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New Jap Plane Data

(Continued from page 12)

TYPE	AICHI T97 (Aichi 92) Navy Reconnaissance.
DIMENSIONS	Span 42.6 ft. Length 32.5 ft. Wing area 430 sq. ft.
DUTY	Reconnaissance. Spotting. Seaplane.
CREW	2.
GENERAL DESCRIPTION	Single-engine, twin float biplane. Fuselage is probably of tubular metal construction.
ENGINES	One Aichi of 770 h.p. at 13,000 ft.
AIRSCREW	Fixed pitch.
ARMAMENT	1 x 7.7 mm. fixed forward fuselage. 1 x 7.7 mm. free dorsal.
PERFORMANCE	Normal weight 5,630 lb. Maximum speed 180 m.p.h. at 13,000 ft. Cruising speed 155 m.p.h. with a range of 410 miles, or 2.65 hours on 120 gallons.

TYPE	KAWANISHI T97 (Kawa 94) Navy Torpedo-bomber.
DIMENSIONS	Span 45.5 ft. Length 38 ft. Wing area 680 sq. ft.
DUTY	Bomber. Torpedo-dropping. Seaplane.
CREW	2.
GENERAL DESCRIPTION	Single-engine, twin-float biplane. There is a tail float. Fuselage is probably of tubular metal.
ENGINES	One Kawanishi 12-cyl. liquid-cooled of 650 h.p. at 7,000 ft.
ARMAMENT	1 x 7 mm. fixed forward fuselage. 1 x 7.7 mm. free dorsal.
PERFORMANCE	Normal weight 8,000 lb. Maximum speed 155 m.p.h. at 7,000 ft. Service ceiling 19,000 ft. Cruising speed 135 m.p.h. with a range of 450 miles, or 3.3 hours, carrying 1,760 lb. Torpedo and 120 gallons.

TYPE	NAKAJIMA (Naka 93) T97 Navy Fighter.
DIMENSIONS	Span 36.8 ft. Length 33.5 ft. Wing area 185 sq. ft.
DUTY	Fighting. Reconnaissance. Seaplane.
CREW	2.
GENERAL DESCRIPTION	Single engine, mid-wing twin-float monoplane. Wing with slight taper and dihedral, rounded fin. Floats braced to wings. Probably of metal construction.
ENGINES	One Nakajima aircooled radial of 750 h.p. at 13,000 ft.
AIRSCREWS	3 blade metal.
ARMAMENT	2 x 7.7 mm. free forward fuselage. 2 x 7.7 mm. free dorsal.
PERFORMANCE	Normal weight 5,300 lb. Maximum speed 220 m.p.h. at 13,000 ft. Service ceiling 27,000 ft. Cruising speed 190 m.p.h. with a range of 325 miles or 1.71 hours on 85 gallons.

TYPE	AICHI T98 (Aichi 104) Navy Bomber.
DIMENSIONS	Span 87 ft. Length 63 ft. Wing area 940 sq. ft.
DUTY	Bombing. Possibly torpedo-dropping. Reconnaissance Seaplane.
CREW	5.
GENERAL DESCRIPTION	Three engine, mid-wing, twin-float monoplane. Wings tapered to rounded the tips slight dihedral, single-fin tailplane with rounded rudder and fin. Streamline all-metal construction fuselage with long cockpit cover.
ENGINES	Three Aichi aircooled radials of 770 h.p. at 13,000 ft.
AIRSCREWS	3 blade metal.
ARMAMENT	Reported armament includes 2 x 37 mm. but 20 mm. calibre more likely. 1 x "cannon" forward fuselage. 4 x 7.7 mm. fixed forward wings. 1 x "cannon" free dorsal.
PERFORMANCE	Normal weight 26,400 lb. Maximum speed 230 m.p.h. at 13,000 ft. Service ceiling 24,000 ft. Cruising speed 199 m.p.h. with a range of 1,000 miles, or 5 hours, with 2,200 lb. bombs and 590 gallons.
MAXIMUM TANKAGE	880 gallons.

TYPE	KAWASAKI T97 Army Light Bomber Recco. (Pictured below).
DIMENSIONS	Span 47.7 ft. Wing area 295 sq. ft.
DUTY	Bombing. Reconnaissance.
CREW	2
GENERAL DESCRIPTION	Single engine, low mid-wing monoplane with single-leg type fixed under-carriage. Wings tapered with rounded tips, split flaps, and small wing root fillets. Metal, stressed-skin construction, but control surfaces are fabric-covered. The tail unit has a single fin and rudder. Long perspex-covered cockpit with a dorsal gun position, or, alternatively faired into the fuselage. Spatted wheels.
ENGINES	One Kawasaki 12-cyl. liquid-cooled of 900 h.p. at 6,500 ft.
AIRSCREWS	3 v.p. metal.
ARMAMENT	1 or 2 x 7.7 mm. fixed forward fuselage. 1 x 7.7 mm. dorsal.
PERFORMANCE	Normal weight 7,000 lb. Maximum speed 236 m.p.h. at 13,000 ft. Service ceiling 25,000 ft. Cruising speed 206 m.p.h. with a range of 490 miles, or 2.38 hours on 100 gallons.

Kawasaki T97 Army Light Bomber

2-Place Craft Is Fitted with 900-hp. Engine

Mitsubishi T96 Navy Bomber

Maximum Speed Is 230 mph. at 10,000 Ft.

TYPE	MITSUBISHI T96 (Mark iv) Navy Bomber. (Pictured above).
DIMENSIONS	Span 82 ft. Length 54 ft. Wing area 800 sq. ft.
DUTY	Bombing. Reconnaissance.
CREW	4-7.
GENERAL DESCRIPTION	Twin-engine, mid-wing monoplane with retractable undercarriage. Tapered wings with Junkers-type flaps and ailerons extending whole length of trailing edge. Twin rudder tail, fins half way between fuselage and tips of tail-plane. Cockpit forward of leading edge, metal-pannelled nose, fuselage tail-cone extends beyond tail-plane. Two dorsal gun positions with perspex covers. Some versions have large perspex dome amidships and two side blisters.
ENGINES	2 Mitsubishi or Kinsei IV, 14-cyl. air-cooled radials of 1,000 h.p. at 10,000 ft.
AIRSCREWS	3 blade v.p. metal.
ARMAMENT	2 x 7.7 mm. fixed forward wings. 1 x 7.7 mm. and/or 20 mm. free dorsal turret. 2 x 7.7 mm. free lateral. 1 x 7.7 mm. free ventral. 1 x 7.7 mm. fixed tail.
PERFORMANCE	Normal weight 22,000 lb. Maximum speed 230 m.p.h. at 10,000 ft. Service ceiling 24,000 ft. Cruising speed 200 m.p.h. with a range of 950 miles, or 4.75 hours, carrying 2,200 lb. bombs and 490 gallons.
MAXIMUM TANKAGE	780 gallons.

TYPE	SHOWA T99 (Sho. 98) Army Fighter-Bomber.
DIMENSIONS	Span 50 ft. Length 37 ft. Wing area 335 sq. ft.
DUTY	Bombing. Fighting. Probably reconnaissance.
CREW	2-3.
GENERAL DESCRIPTION	Single-engine, low wing monoplane with retractable undercarriage. Tapered wings and rounded tips, slight dihedral, single-fin tail. Metal construction. Rounded fuselage with long perspex covered cockpit.
ENGINES	One Showa air-cooled radial of 850 h.p. at 5,800 ft.
AIRSCREWS	2 blade metal.
ARMAMENT	1 x 7.7 mm. fixed forward fuselage. 2 x 20 mm. fixed forward wings. 1 x 7.7 mm. free dorsal.
PERFORMANCE	Normal weight 9,700 lb. Maximum speed about 220 m.p.h. at 6,800 ft. Cruising speed 180 m.p.h. with a range of 950 miles, or 5.1 hours, carrying 600 lb. bombs and 200 gallons. Alternatively, 880 miles with 2,280 lb. bombs.
MAXIMUM TANKAGE	396 gallons.

TYPE	MITSUBISHI T96/2a Navy Fighter.
DIMENSIONS	Span 36 ft. Length 24.5 ft. Wing area 170 sq. ft.
DUTY	Fighting (Dive bombing) Deck landing.
CREW	1
GENERAL DESCRIPTION	Single-engine, low wing monoplane with fixed divided type undercarriage and spats. Wings fitted with flaps and wing root fillets, rounded fin and rudder. Cockpit with head fairing extending along fuselage, merging into fin, pointed fuselage and projecting beyond tail unit. Metal construction.
ENGINES	1 Kinsei air-cooled radial of 730 h.p. at 9,000 ft.
AIRSCREW	3 blade metal.
ARMAMENT	2 x 7.7 mm. fixed forward fuselage. Possibly 2 x 7.7 mm. fixed forward wings.
PERFORMANCE	Normal weight 4,300 lb. Maximum speed 250 m.p.h. at 9,000 ft. Service ceiling 31,000 ft. Cruising speed 217 m.p.h. with a range of 440 miles or 2 hours on 80 gallons.

TYPE	MITSUBISHI T96 Navy Dive-Bomber.
DIMENSIONS	Span 37.5 ft. Length 30.8 ft. Wing area 420 sq. ft.
DUTY	Dive bombing. Deck landing.
GENERAL DESCRIPTION	Single-engine biplane with fixed split undercarriage and spatted wheels. Two-bay wings of parallel chord, with ailerons on both upper and lower wings. Centre section strongly braced to fuselage single fin and rudder with wire bracing. Open cockpit with small perspex superstructure between pilot and gunner. Wings and fuselage fabric covered. Wings fold.
ENGINES	One Kinsei 9-cyl. air cooled radial of 730 h.p. at 7,000 ft.
AIRSCREWS	Fixed-pitch.
ARMAMENT	2 x 7.7 mm. fixed forward fuselage. 1 x 7.7 mm. free dorsal.
PERFORMANCE	Normal weight 5,200 lb. Maximum speed 200 m.p.h. at 10,000 ft. Service ceiling 23,000 ft. Cruising speed probably about 135 m.p.h. range not known.

TYPE	NAKAJIMA T96 Navy Torpedo-Bomber.
DIMENSIONS	Span 49 ft. Length 33 ft. Wing area 540 sq. ft.
DUTY	Bombing. Torpedo-dropping. Possibly reconnaissance. Deck-landing.
CREW	3.
GENERAL DESCRIPTION	Single-engine, biplane with fixed divided-type undercarriage, spatted wheels. Staggered wings of equal span, which can be folded, braced tail plane with rounded rudder. Fuselage of rectangular section, apparently fabric covered.
ENGINES	One Kotobuki air-cooled radial of 600 h.p. at 8,000 ft.
AIRSCREW	2 blade wooden fixed pitch.

(Continued on page 17)

Lightning Strikes

Hard-striking, fast-striking Lightning...a wizard of high-altitude maneuverability ...the Lockheed *Lightning* is a tough-sinewed interceptor, a ship built to reach new sky ceilings—and stay there to take and give plenty of fight.

It is a 'plane made to stop enemy bombers ...dive or long range, high or low altitude... before they get to their objectives.

Built, too, as a fighting guard for our own bombers, it is a 'plane to sweep enemy skies as well as our own, teaming up with other hard-fighting American-built aircraft flying for the United Nations to win air supremacy to win this war.

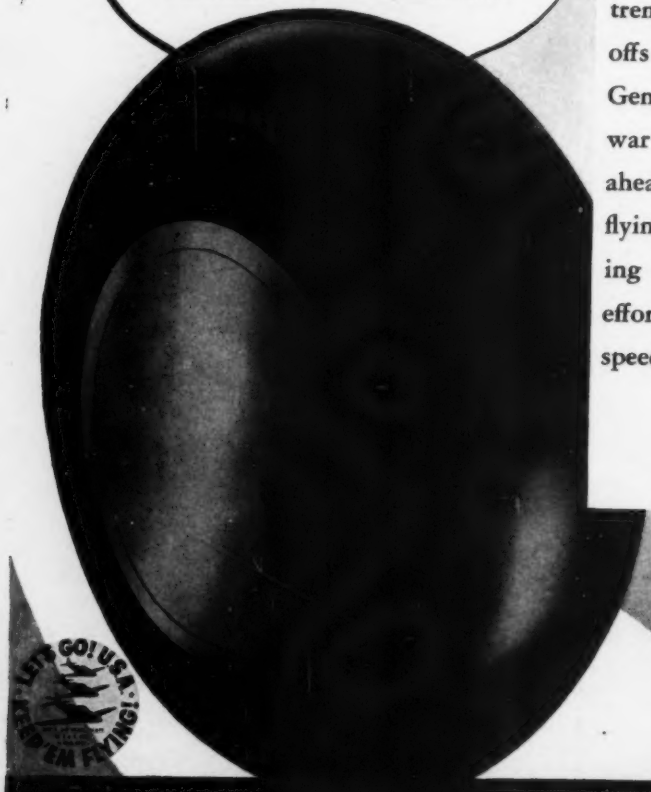
... for Protection today and Progress tomorrow

LOOK TO *Lockheed* FOR LEADERSHIP

Lockheed Aircraft Corporation • Burbank, California

Quality Leadership *knows no ceiling*

THE STREAMLINE, SMOOTH-CONTOUR AIRPLANE TIRE, ORIGINATED, DEVELOPED, PATENTED BY GENERAL



IN the nation's Battle of Production there is no power on earth to substitute for foresight in development and leadership in Quality manufacture. That's why American aviation is turning confidently to General now for tires equal to the tremendously increased strain of modern-day take-offs and landings. The streamline, smooth-contour General—used by our armed forces long before the war . . . refined and improved continually to keep ahead of the changing requirements of military flying—is being produced today at an ever-increasing rate. There is no ceiling on General's all-out effort to develop and build products that will help speed our air forces to final Victory.

See your Fixed Base Operator, or write,

THE GENERAL TIRE & RUBBER CO.

Aviation Division, Akron, Ohio

The GENERAL AIRPLANE TIRE

KNOWN AROUND THE WORLD FOR QUALITY AND SAFETY

Enemy Planes

(Continued from page 14)

ARMAMENT	1 x 7.7 mm. free dorsal.
PERFORMANCE	Normal weight 7,300 lb. Maximum speed 168 m.p.h. at 8,000 ft. Service ceiling 20,000 ft. Cruising speed 145 m.p.h. with a range of 145 miles, or 2.9 hours, carrying 1,760 lb. Torpedo and 100 gallons or a range of 900 miles with 900 lb. bombs and 180 gallons.

TYPE	MITSUBISHI T97 Navy Fighter.
DIMENSIONS	Span 40 ft. Length 25 ft. Wing area 170 sq. ft.
DUTY	Fighting. Deck landing.
CREW	1
GENERAL DESCRIPTION	Likely to be the Mitsubishi T96/2B with minor modifications. Single-engine, low-wing monoplane with retractable undercarriage.
ENGINES	9 cylinder air-cooled radial of 650 h.p. at 9,000 ft.
AIRSCREW	3 blade variable pitch.
ARMAMENT	2 x 7.7 mm. fixed forward fuselage.
PERFORMANCE	Normal load 4,500 lb. Maximum speed 265 m.p.h. at 11,000 ft. Service ceiling 30,000 ft. Cruising speed 225 m.p.h. with a range of 590 miles, or 2.6 hours, on 80 gallons.
MAXIMUM TANKAGE	110 gallons.

TYPE	MITSUBISHI T96 Navy Flying-Boat.
DIMENSIONS	Span 96.7 ft. Length 70 ft. Wing area 2,500 sq. ft.
DUTY	Reconnaissance, Bombing, Transport.
CREW	6.
GENERAL DESCRIPTION	Believed to be a sealed up version of the Short "Calcutta" flying boat. Three engine, biplane. Braced wings of unequal span, single-fin braced tail unit. Wing floats. Single hull of metal construction.
ENGINES	Three Mitsubishi 12-cyl. "V" liquid-cooled 900 h.p. The nacelles are mounted between the wings.
AIRSCREWS	2 blade.
ARMAMENT	Not known but believed to include 1 x 37 mm. and 4 x 7.7 mm. guns.
PERFORMANCE	Normal weight 38,750 lb. Maximum speed 145 m.p.h. at 10,000 ft. Service ceiling 13,000 ft. Cruising speed 125 m.p.h. with a range of 1,400 miles or 11.25 hours, carrying 2,000 lb. bombs and 1,450 gallons.

TYPE	AWANISHI T97 Navy Flying Boat.
DIMENSIONS	Span 131 ft. Length 81 ft.
DUTY	Reconnaissance. Bombing. Torpedo-dropping.
CREW	10.
GENERAL DESCRIPTION	Reported to be based on the S42 Sikorsky flying boat. Four-engine, parasol monoplane. Braced wing and tail unit, twin rudders. Wing floats. Single hull.
ENGINES	Four Kinsei 4C 14-cyl. air-cooled radials of 900 h.p. at 13,000 ft. The nacelles are mounted in the leading edge of the wing.
AIRSCREWS	3 blade metal.
ARMAMENT	Turret forward fuselage. Turret dorsal.
PERFORMANCE	Normal weight 45,000 lb. Maximum speed 215 m.p.h. at 13,000 ft. Service ceiling 26,000 ft. Cruising speed 165 m.p.h. with a range of 1,500 miles, or 9 hours on 1,500 gallons, or with 3,500 lb. bombs a range of 1,450 miles.
MAXIMUM TANKAGE	Estimated 1,950 gallons.

TYPE	NAKAJIMA T95 Navy Reconnaissance.
DIMENSIONS	Span 36.1 ft. Length 27.9 ft. Wing area 330 sq. ft.
DUTY	Reconnaissance. Spotting. Seaplane.
CREW	2.
GENERAL DESCRIPTION	Single-engine, central-float biplane. Swept-back wings of approximately equal span, with interplane and centre section bracing by "N" struts, single fin and rudder. Large central float carried on four struts, wing floats outboard of interplane struts. Open cockpits. Wings and fuselage apparently fabric covered.
ENGINES	One Kotobuki 9-cyl. air-cooled radial of 600 h.p. at 11,000 ft.
AIRSCREWS	2 blade metal fixed-pitch.
ARMAMENT	1 x 7.7 mm. fixed forward fuselage. 1 x 7.7 mm. free dorsal.
PERFORMANCE	Normal weight 5,800 lb. Service ceiling 18,000 ft. Maximum speed 160 m.p.h. at 11,000 ft. Cruising speed 135 m.p.h. with a range of 500 miles, or 3.7 hours, carrying 220 lb. bombs and 120 gallons, or with 500 lb. bombs and 85 gallons a range of 320 miles.

Hitler's Responsible For Design Changes, Larry Bell Asserts

"THEY criticize us for changing the designs of planes. My God, we're not changing them. Hitler's changing them," Larry Bell, president of Bell Aircraft Corp., said in a recent address delivered in Georgia and reviewed in the company's house organ.

"We've got to make planes better. The aircraft industry is not going to be a party in building inferior planes," Bell continued. "And what about the plant after the war? That is a question of no import whatsoever. We'll worry about the problem of after-the-war when after the war comes.

"We shall bring into this Georgia plant only a nucleus of a force that can drill the new workers in the jobs they are to handle. As soon as we can, we shall relieve these relatively few imported workers and send them back to their own jobs."

What Others Say

COL. E. V. RICKENBACKER, president and general manager, Eastern Air Lines—"This is going to be a long war—not just a year or two, but five, six, seven, eight years. Before long we'll need 300,000 flyers—100,000 in training, 200,000 in the air—plus 3,000,000 men on the ground to keep them fighting . . . Why not take 16-year-old boys out of high school and start teaching them basic flying? Give them ground school training. Give them something they can use when the time comes. We'd better put some of our liberties in escrow now so we can have them later."

THE AEROPLANE (British)—"Towards the end of last year Canada released a number of Bell Airacobra fighters and Consolidated Catalinas which were about to be delivered to the RCAF, to Great Britain. Besides Douglas Digbys, Lockheed Hudsons, Bristol Bolingbrokes and Stranraer flying boats, Canada has added a number of Catalina flying boats and Curtiss Kittyhawks to the strength of the RCAF. Seventeen squadrons of the RCAF are serving overseas and before long the number should be increased to 25."

MAJ. ALEXANDER P. de SEVERSKY—"Aircraft carriers are among the most vulnerable vessels afloat. They offer perfect targets for defensive aviation. It is not even essential to sink them. A direct hit on the wide expanse of deck is enough to destroy a carrier's usefulness, tying up the aircraft on board and stranding the planes which happen to be in the air at the moment. Carriers violate the basic principle of safe air bases in that they represent maximum concentration of planes in a minimum of space, when safety for aircraft on their base depends on dispersion."

W. A. PATTERSON, president, United Air Lines—"We are faced with the necessity of developing a sufficient traffic in express and freight so that revenue from that source will be the largest rather than the smallest portion of our total revenues. Movement of cargo, rather than passengers and mail, is the principal and historic justification of all successful transportation methods, and so shall it be for air transportation."

SOUTHERN FLIGHT—"In spite of almost unanimous political, military and public opinion on the subject of airpower, in spite of the fact that practically everyone is in agreement that without airpower we are gone-goslings, we permit the most damnable crime to persist right under our very noses—the Selective Service policy of drafting irreplaceable technicians, pilots, mechanics, engineers and other trained specialists into the walking army. Untold thousands are being drafted every week while foot army contingents are dying in both hemispheres for lack of sufficient airpower. Airmen especially are being drafted at an alarming rate. It is authoritatively estimated that some 15,000 graduates of Civilian Pilot Training courses have been inducted into the ground forces. Here is one of the most flagrant and destructive practices now being tolerated in our war effort."

GLENN L. MARTIN, president, Glenn L. Martin Co. (In his Annual Report)—"During 1941, the priority ratings assigned to the company's major aircraft contracts were not as high as those assigned to certain other contracts for aircraft as well as to certain other classes of war products. Consequently, both facilities expansion and aircraft production programs did not progress as rapidly as was anticipated at the time these undertakings were assumed. It is now expected that the A-1-a priority rating recently assigned to all aircraft contracts will tend to improve this condition."

SEN. ARTHUR CAPPER (R., Kan.)—"It is high time for the administration to give some consideration to the problem of having some industries and business left on which to levy taxes for the hundred and more billions of dollars needed for the war effort."

NEW YORK TIMES—"With the increasing toll of coastwise shipping now being taken by Axis submarines, there is good reason to push the expansion of our blimp fleet with all possible speed as one of the hopeful factors in the naval warfare along both coasts."

DWANE L. WALLACE, president and general manager, Cessna Aircraft Co.—"Cessna employes sometimes ask why we do not increase production . . . Critical materials are controlled so that each type of military plane will be produced as required. If we built more planes than our quota, we would be taking vital material which might delay production on other badly needed fighting planes. We are all hoping that the flow of materials will soon be increased. This will permit us to boost our output of Cessna bomber-pilot trainers. We know we can do this immediately."

XUM

Wright Field Studies Nazi Glider Uses

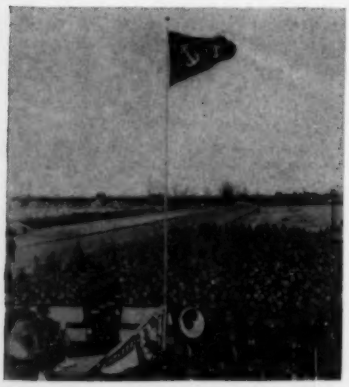
FURTHER progress in experiments to discover new uses for gliders in modern warfare as practiced by the Nazis has been reported from Wright Field, home of the large glider unit of the Materiel Division of the Army Air Forces, with the announcement of successful pick-ups of gliders resting stationary on the ground by an airplane passing overhead at close to 100 mph.

The basic device that made this experiment successful was a winch drum, equipped with a brake, in the airplane. This drum reeled out sufficient line to ease the acceleration of the glider. Once in the air and up to towing speed the glider was reeled in to the proper towing interval by a small electric motor driving the winch. This development may solve the problem of launching a train of transport gliders and may also make it possible to pick up several gliders from a field too small for the safe take-off of the airplane alone.

A program of flight testing with the small two-place training gliders has also been going on at Wright Field for some months. Some of the items tested have been types, sizes and lengths of towlines, various combinations for multiple towing, intercommunication between gliders and towplane and so on.

The glider unit has worked toward the development of several designs of 8- and 15-place gliders. The Navy is building 12- and 24-place gliders to be used by the Marine Corps. Construction of the Army ships is well under way and the first static test and flight test transport gliders have been delivered.

Wright Field has devoted much study on reports of German military gliders. A new use of the large towed craft, that of supplying troops on far flung fronts, has been demonstrated by the Germans in Libya and the Crimea. Although definite figures are not yet available, it is reliably reported that the gliders being used by the Germans in these operations are of huge size with wing spans ranging from 80 to 130 feet or more.



Burgee: The Navy 'E' for production achievement was presented by Rear Adm. John H. Towers, chief of the Bureau of Aeronautics, to Pratt & Whitney Aircraft recently. The burgee, first to go to an industry for aircraft production, is shown flying from a temporary staff on the speakers' platform.

North American B-25s Smash Japs in Philippines

Air Forces Pilots Heap Praise on 'A Helluva Fine Airplane'

Navy 'E' to Grumman

Grumman Aircraft Engineering Corp., Bethpage, N. Y., producers of the famous "Wildcat" fighter and other Navy planes, has received the Navy "E" for excellence in production.

Lighter-Than-Air Men

The Navy Dept. has asked Congress to amend the Organic Aeronautics Act of 1926 to permit rating of commissioned and enlisted pilots of non-rigid airships so as to insure intact maintenance of a nucleus of highly experienced lighter-than-air men.

In his letter to Congress, Navy Secretary Knox said: "It is believed that the designation referred to above would have the important advantage of insuring intact maintenance of a nucleus of highly experienced lighter-than-air men. It would at the same time offer a reward for superior ability . . . Primarily however, it would provide a supplementary supply of a limited number of non-rigid airship pilots from enlisted sources instead of having to depend entirely upon the already highly taxed commissioned ranks."

Proving Ground Branch

PROVING Ground Command, headed by Col. Grandison Gardiner and charged with the testing of military aircraft and equipment to determine their performance characteristics, has been organized by the Air Forces.

Headquarters will be located at Wright Field.

BEECH AIRCRAFT CORP., Wichita, Kan., having conducted a special production period designated as MacArthur Week (Mar. 29-Apr. 4), announces that all production records for the plant were broken.

Wanted: Another Thomas Edison

FOREWARNING the arrival of a great inventive genius to take his place along side of Edison, Bell, and Marconi in the halls of fame, the following advertisement recently appeared in a New York newspaper:

"TO BRING DOWN EVERY JAP PLANE within 50 miles in 20 minutes, without loosing a man! An engineer, nationally known in a big production industry, who was chief engineer of a plant that built 30 aircraft engines a day during World War I, is looking for a partner to develop a new weapon that promises to do this. Other engineers, including some even better known, agree that the idea is reasonable.

"The development program will take $1,000,000 and 10 months. No profit asked or promised on this first step, but it should produce a weapon to win the war.

"There are unequalled goodwill possibilities in it, and two new post-war products to be made with the same tools.

"No broker, agent, promoter, or lobbyist wanted!"

Aircraft to Be Navy's Backbone, Says Admiral

THE TIME when aircraft will be the backbone of the Navy is at hand, with planes just as important as ships and both of them desperately needed right now, according to Vice Adm. S. M. Robinson, U. S. N.

"I would like to say a word about a misunderstanding which has gained fairly universal acceptance," he said. "It has to do with the notion that until a very recent date the Navy's need of planes has been subordinated to its need of ships and that even now those responsible for this supposed condition are yielding ground, but slowly and with the greatest reluctance.

"A concise statement of the matter is this: It is not more planes and fewer ships that the Navy needs. Our need is for more planes and more ships and more guns for both. There is no room for talk of less of anything. Somehow we have got to find a way to produce a great deal more of everything.

"This ship-versus-plane controversy has been aptly characterized by Adm. Hart as 'just plain silly.' It is as silly as an argument between the arms and the legs and the trunk of a body as to which enjoys the principal importance. It is purely incidental which of the two—whether the ships or the planes—may be regarded as the trunk and which as the arms and legs.

"For my own part, I am convinced that the time is not far distant when the air force will come to be looked on as the trunk with the ships as its arms and its legs. I say this as one whose principal interest has for some years been concentrated on the building of ships, and I state it as an opinion which I have long entertained."

Teamwork SCORES AGAIN

Result of more than a year's research, the application of low alloy steel to aircraft structures was immediately made available by North American Aviation to other aircraft manufacturers. Here is another demonstration of teamwork in the aircraft industry. Individual manufacturers are on the alert for ways to win the war. They are working together the American way.

NORTH AMERICAN AVIATION, INC.
INGLEWOOD, CALIFORNIA
Member of Aircraft War Production Council, Inc.

NORTH AMERICAN BUILDS:
P-51 Mustang Pursuit
B-25 Mitchell Bomber
AT-6A Harvard Trainer

KEEP 'EM FLYING · GET 'EM BUILT

BUILD AND FIGHT WITH TEAMWORK THE NORTH AMERICAN WAY

Studio of a "scientist" during the Renaissance. From "Nova Reperta," a suite of engravings depicting celestial navigation instruments and other new inventions of the early 16th Century. Reproduction from the Bettmann Archive.

THE WORLD was demonstrated to be round many years before any one cared or dared to sail around it.

The air was declared to be a "navigable ocean" a century before man's first successful airplane flight.

These lapses of time signify, perhaps, mankind's lack of compelling motive to seek, on such a heroic scale, new benefits for human welfare. But today, the free world has never been so aware of the necessity for seizing upon every scrap of scientific knowledge and using it for world betterment. Never in the history of the world have ideas been so rapidly converted into practice.

One of the things which is providing this acceleration is air transportation. Its outstanding miracle is that the ocean of the air is brought to the doorstep of every city—no matter where it is. And every city—no matter where it is—becomes, in effect, a world port. Thus does air transportation make the people of the world *citizens* of the world—with the responsibilities as well as the opportunities which such a citizenship entails.

AMERICAN AIRLINES *Inc.*

ROUTE OF THE FLAGSHIPS

Brewster Plants Placed in Hands of Navy Dept.

THE SECRETARY of the Navy has taken possession of and is operating the manufacturing plants of Brewster Aeronautical Corp., pursuant to authorization granted by President Roosevelt, it became known on Apr. 20.

The action followed a report by Sen. Byrd (D., Va.) concerning slowdowns in eight war plants, including Brewster, which was made on Apr. 18.

The Brewster plants concerned are located at Long Island City, N. Y.; Newark, N. J.; and Johnsville, Pa. Capt. George C. Westervelt, Construction Corps, U. S. N. (Ret.), has been designated by the Secretary of the Navy to take charge of operations at the Brewster plants.

"The Brewster Aeronautical Corp. holds contracts for combat types of aircraft, the orderly and regular delivery of which is essential to the war effort," the Navy's announcement said. "The existing private control of Brewster Aeronautical Corp. has not been proved adequate, under the circumstances confronting it, effectively to operate the corporation's plants so as to assure these essential deliveries.

"The President has therefore directed the Secretary of the Navy to provide for the operation of the plants by the government until the President determines that the plants will be privately operated in a manner consistent with the war effort," the announcement explained.

The President's order was dated Apr. 18 and was issued concurrently with the Navy's announcement Apr. 20.

Army-Navy Personnel

Ten Army Air Forces colonels have been nominated for the temporary grade of brigadier general. The list includes **Col. Frank O'D. Hunter**, one of the Army's noted pursuit pilots of the World War; **Col. Claire L. Chennault**, who is in command of the American Volunteer Group which has seen much action in the present war in China and Burma; and **Col. Harold L. George**, commander of the Ferrying Command. Other officers are: **Hume Peabody, William E. Farthing, Shepler W. Fitzgerald, Walter F. Kraus, Isaiah Davies, Clayton L. Bissell,** and **Harold M. McClelland.**

Lt. George Ola, formerly engineering officer at Carlstrom Field, Arcadia, Fla., has been promoted to Army commanding officer at the field. He replaces **Lt. M. P. Freeman** who has been transferred to Moultrie, Ga. **Lt. Lester E. Richardson** is the new cadet commander at Carlstrom Field, succeeding **Lt. William A. Hart**, who has become adjutant.

Harold Gatty, who flew around the world with the late Wiley Post in 1931, has accepted a post with the Army Air Corps in Australia.

Glider Training Urged As Test of Pilot Material

YOU CAN'T test an aircraft engine thoroughly while it is on the ground nor can you adequately ground-test prospective pilots by psychological and medical examinations. Get the boys in the air in their 'teens' and they will prove their piloting ability over and above any minor physical handicaps which now figure so prominently in Air Corps examinations.

These are the beliefs of Dr. M. N. Walsh of the Mayo Clinic, Rochester, Minn., who feels that the selection of men for pilot training has been approached from the wrong direction.

In a recent issue of "Proceedings of the Staff Meetings of the Mayo Clinic," Dr. Walsh, a pilot himself, says, "In the final analysis the capability of a person for any type of skilled endeavor, such as flying, is best tested when he is actually given the opportunity to do the thing for which his fitness is being tested."

Early Start Urged

Urging that boys be started out at model-making, soaring and gliding while they are in school, Dr. Walsh said, "Germany, followed shortly by Russia and later by Japan, established government-sponsored gliding and soaring centers in all parts of the respective countries, and the principles of airplane construction, aerodynamics and meteorology were taught to boys in primary and secondary schools and in universities. . . . hundreds of thousands of them were taught to fly at an early age so that reflexes important in flying were developed in them and became an integral part of their lives.

"The intensive programs of gliding, soaring activities and sports carried out by the aforementioned nations served another important purpose—that of selection of pilots. . . . the selection of a person with a ready intelligence as shown by his school record and a flair for flying as shown by his soaring and gliding record, was bound to add a good pilot to the air forces.

"The logic of this type of program for the selection of pilots is incontrovertable. The selection if done after all candidates have been exposed to actual flying conditions and have been indoctrinated with the basic principles of flying (which are the same in either a motorless plane or a plane powered with a motor), while the youths were at such an early age that they 'grew into flying,' so to speak, so that special reaction patterns necessary in flying became almost instinctive."

The only reason that such a program has not yet been undertaken in this country, the birthplace of the airplane, is that we have fancied ourselves so secure that a large-scale demand for pilots never could arise. That demand has arisen. It is now unfortunately necessary to select large numbers of candidates quickly for the U. S. air forces, Dr. Walsh asserts.

"Although psychological tests may provide a limited amount of information at times, it is definitely dangerous to rely on them for decision as to acceptance or rejection of candidates for the air forces . . . The present war will probably be long and steps should be taken immediately to set up the mechanism by means of which American boys can be given the advantages of this type of training . . .," said Dr. Walsh, a member of the five-man Minnesota Aeronautics Commission.

Minnesota's Program

He went on to point out, "In Minnesota it has been possible with the active co-operation of Gov. Harold Stassen, to lay the foundation for a state program of gliding and soaring activities, and conferences are in progress with educational officials toward the objective of instruction in aeronautics and model-making in the schools."

Advocating a change in the physical examination standards so as to admit men with minor physical defects which would not effect their flying ability, he said, "The number of physical defects which disqualify a candidate for military aviation probably is less than has been imagined. A large number of physically perfect persons are totally unfit for military flying because of temperament, whereas others who have physical defects make superlative combat flyers, as witness Squadron Commander Bader of the RAF, who has lost both legs.

"Entirely apart from the grim business of war" Dr. Walsh concludes, "American youth should be trained systematically in the theory and practice of flying and those best adapted should be allowed to demonstrate their fitness to be pilots so that in the future time of peace the U. S. may take its rightful place as the leader in the world in the air."

'Gliding Serves in the Selection of Pilots'

Special Reaction Patterns Become Almost Instinctive

Paper Work: Suggesting a need for streamlining war production, W. A. Dewald and J. F. Lincoln of Lincoln Electric Co., examine 5¼ lbs. of priority extensions which accompanied a recent order for 700 lbs. of arc welding electrodes. In the photo can be seen 14 containers each holding 50 lbs. of electrode, the amount called for in the order.

New Portable Mat

A new portable air field, which differs from the Marston strip (tested during Army maneuvers in North Carolina last fall), is now being put through Army experiments.

The new field, in the form of a metal "landing mat," can be laid down in approximately two days for emergency use, it is said. Consisting only of a frame-work of bars and rods, the new-type mat weighs only 1.9 lbs. a sq. ft., or 450 tons for the entire strip.

Said to be a primary advantage of the mat is the fact that grass is able to grow up between the bars and rods, thus screening it against enemy observation and photographic planes a few weeks after it has been installed. It has been designed primarily for lightplanes, such as observation, pursuit and light attack ships.

More Boeings Offered

BOEING AIRCRAFT CO. has offered to speed its production increase of Flying Fortresses further in its Seattle plants, but the schedule must be governed by allotments of materials and equipment, according to Col. John S. Griffith, resident representative of the Air Corps at the plant. Col. Griffith said production of the four-engine bombers at Seattle has been doubled since Pearl Harbor. Speaking at an Army Day celebration, he said deliveries "have been consistently on or ahead of schedule and are ahead of schedule at this time."

XUM

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Fortnightly Review

(Continued from page 1)

supply job is nothing short of stupendous.

As Al Williams succinctly expressed it in one of his recent newspaper columns: "Air transportation is the only answer." It is obviously impossible to escape from reliance on surface shipping for the bulk of the transport problem for the present—we need hundreds and hundreds of surface vessels under any condition. But the cargo airplane offers a highly valuable—indeed, *essential*—supplementary form of transportation and we are elated that the Army is not only turning to this flexible and fast mode of transportation but is relying on experienced and trained airline men and organizations to do the job.

As we have pointed out on many occasions, the biggest problem of all up to the present time, has been the achievement of *recognition* of the airplane and what it can do, not as a fighting airplane because that recognition came long ago, but as an aerial vehicle to transport men and equipment long distances in short periods of time.

The weekly news magazine, *Time,* said in its discussion of the world-wide air freight problem in its Apr. 20 issue: "Coming up fast is an astonishing solution: the airplane, not as a flashy offensive weapon, but as a plain, hard-working jack-of-all-transport." There is nothing "astonishing" in the use of the airplane for transportation and we are sure that knowing *Time* itself was not astonished. The transport airplane can't do any more today than it could have done 5 to 10 years ago. It is no 1942 invention. The Germans have made no secret of their use of the transport airplane. Transport airplane construction facilities were going begging only a couple of years ago. What *is* astonishing is the length of time it has taken this country to condition its thinking in terms of transportation of cargo and war equipment by air.

Astute and farseeing Glenn L. Martin who could never be accused of lagging behind and who has always been at the forefront of U. S. aviation, said in Detroit the other day that his company has plans for a 250,000-pound commercial air vessel and that 500,000-pound airplanes can be built "in a very few years" (See story on page 44). It is no credit to the U. S. that it did not commission Glenn Martin to start construction of his 250,000-pound airplane two or three years ago. To date we have built just two airplanes weighing about 140,000-pounds each; we should have had a great many of these under way.

The answer to what the large heavy-load airplane can do in this war effort is supplied by Grover Loening, the well-known aeronautical consultant, in *Foreign Affairs* for April. To some Mr. Loening's statements may sound "astonishing," but here again the astonishing feature is that this country with its avowed aeronautical leadership has been so backward and shortsighted in its almost complete neglect of the airplane for transportation.

An average cargo steamer of 11,000 tons displacement can make only two and one-half trips a year between New York and the Red Sea, Mr. Loening points out. Such a steamer travels about 10 miles an hour and carries about 6,000 tons of cargo. That's 15,000 tons of cargo per year. But no more than 15 80-ton airplanes of the Douglas B-19 and the Martin Mars class, carrying about 20 tons each and making 50 round-trips per year, could do the same job. The risks of losing 6,000 tons of cargo by a single submarine torpedo would be eliminated. To be sure, the cost of constructing 15 airplanes of that size and type would be considerably more than the cost of an 11,000 ton freighter, but in an all-out war cost is hardly a factor. (The illustration is akin to that of the ill-fated Burma Road over which one airplane of the DC-3 type was equal in carrying capacity over a given period of time to 120 trucks.)

Not only would the submarine menace be eliminated over long-distance water journeys, Mr. Loening points out, but "large numbers of naval ships would be released from convoy work for fighting duties. Precious cargoes of materials and men could be delivered at once where needed. Even more important, they could be delivered where needed with the *surprise* element added."

The generals and admirals of 1926 were convinced that the late Gen. "Billy" Mitchell was a visionary, Mr. Loening says. "They were fatally mistaken. Actual developments in the air quickly surpassed what had seemed to be his extravagant predictions. Today the same thing is happening in the carriage of cargo by air that happened in the case of combat in the air. Command of the air is not in itself enough for the U. S. We also must aim at the command of transportation. For this it is not sufficient to have cargo ships on the sea; we must also have cargo ships over the sea."

Secretary of War Stimson's directive to the air transport industry is an excellent forward step—an excellent beginning. A new and epochal era in U. S. aviation is opening.

Gen. Hugh S. Johnson

AVIATION LOST a staunch friend and supporter in the death of Gen. Hugh S. Johnson. He was one who never permitted his mind to become rusty; his alertness to new ideas kept pace with his years. One of his very last newspaper columns was devoted to the government's pilot training program. He liked to fly, he knew all about airplanes, and he never satisfied his endless curiosity about all phases of aviation. A great figure in American life, he will be missed.

'More Than Ever Before'

C. E. WILSON, president, General Motors Corp., has announced that "by this fall more people will be working in General Motors plants than ever before . . . We have three big plants exclusively producing aircraft engines, backed up by parts production from our Chevrolet, Buick and Cadillac factories . . . General Motors has 90 factories, with approximately 65 million square feet of floor space. Of these factories or plants 86 are already either producing war material or are being re-arranged and re-tooled for war production. War work will be found for the remaining four, or they will be sold or leased to the government or other contractors."

Bookshelf

AMERICA ORGANIZES TO WIN THE WAR, a handbook of the American War effort; Harcourt, Brace & Co., 383 Madison Ave., New York, N. Y.; 193 pp.; $2.

Of most interest to aviation enthusiasts is the chapter of the book on the organization of the Army Air Forces by Lauren D. Lyman, assistant to the president of United Aircraft Corp. The chapter on Navy organization is by Paul Schubert, naval critic for Mutual Broadcasting Co.; and the chapter on Army organization is by S. L. A. Marshall, military critic of the Detroit *News*.

●

ARMY FLYER—Military Aviation as a Career, from Flying Cadet to Air General, by Lt. Gen. H. H. Arnold and Brig. Gen. Ira C. Eaker; Harper & Bros., 49 E. 33d St., New York, N. Y.; 297 pp.; $2.50.

A popularly written book, conceived and published to acquaint the vast army of new flying men, now being trained for our Army Air Forces, with the duties, responsibilities, opportunities and advantages of their new profession. It picks the airman up a fledgling in his flying cadet days, tells him what to expect and how to meet his obligations during training at the schools; how to report and what to expect in his first tactical unit. It traces the whole gamut of the military air career from recruit to general, providing clear instructions for the accomplishment of every assignment and duty.

The book will also appeal to the aviation-minded public for a clear perspective on the new third dimension which has come to warfare.

●

NEEDED—WOMEN IN AVIATION, by Dickey Meyer; Robert M. McBride & Co., 116 E. 16th St., New York, N. Y.; 220 pp.; $2.

This volume is packed with up-to-the-minute authoritative information about how women can serve the war effort in all branches of aviation—as pilots in the Civil Air Patrol; as radio operators on the ground; as riveters in aircraft factories; as typists, telephone operators, watchers, welders, dietitians, letter writers, in the factories and auxiliary services of our great air program.

Miss Meyer gives vital information to the woman desirous of entering the aviation field on "where to go, whom to see, what questions to ask."

The author is director of public relations for the Women Fliers of America, defense career editor of *The Woman*, and an aviatrix, journalist, and photographer of wide experience.

●

AIRCRAFT ASSEMBLY, by C. F. Marschner, project engineer at McDonnell Aircraft Corp.; Pitman Publishing Corp., 2 W. 45th St., New York, N. Y.; 104 pp.; $1.

A concisely written, semi-technical book, surveying the field of aircraft assembly: procedure; design; equipment; riveting and bolting; wing breakdown; wing-spar assembly; wing-rib assembly; box-beam assembly; wing leading-edge, trailing-edge, and tip assembly; control-surface assembly; wing assembly, float assembly, tail assembly, fuselage and hull assembly; landing-gear assembly; and final assembly. Illustrated with photographs and a few diagrams.

●

THE AIRPLANE AND ITS COMPONENTS, by W. R. Sears, chief of Aerodynamics at Northrop Aircraft Inc.; John Wiley & Sons Inc., 440 4th Ave., New York, N. Y.; 75 pp.; $1.25.

This book is intended for engineering students already familiar with technical terminology, and may serve either as an introduction into the specialized field of aeronautics or as a systematic review of that field.

The airplane's internal components are discussed in relation to their relative importance in airplane design; that is, more from the draftsman's than the analyst's point of view.

The material is from a series of lectures given by the California Institute of Technology to non-aeronautical engineers at Lockheed Aircraft Corp.

The book is one of the GALCIT series (Guggenheim Aeronautical Laboratory, California Institute of Technology), originally intended to deal with research problems at Cal Tech. National emergency defense activities have somewhat changed the character of the series.

●

THE MODERN DIESEL, a sixth edition by Iliffe & Sons Ltd., Dorset House, Stamford St., London; 135 pp.

This is a handbook to familiarize the reader with the evolution and latest developments of the diesel engine, with one chapter devoted completely to aircraft engines.

But for the incidence of war, the foreword to the book reads, aircraft engines on the diesel principle would almost certainly have been developed to a stage at which they could challenge the position of gasoline engines, but this problem now remains for attention after the war.

Bruce Foster of *Flight*, British aviation trade publication, is the main contributor to the aircraft section.

●

THE AIRCRAFT APPRENTICE, by Leslie MacGregor; Pitman Publishing Corp., 2 W. 45th St., New York, N. Y.; 134 pp.; $1.50.

To the youth looking forward to employment in the aircraft industry, this book will give a better understanding of the workers and their jobs. It is written in plain language, easily understood by boys of the vocational, junior and senior high school ages.

The information presented will be helpful in assisting students to make their choice of the aviation occupations in line with their aptitudes and abilities. Frequent photographs and diagrams illustrate the text.

●

AIRPORT CONSTRUCTION & OPERATION REFERENCE, 2d Annual Edition, has just been published by Reginald Burrows, Occidental Publishing Co. Ltd., 304 S. Broadway, Los Angeles, Cal.; 82 pages of directory, editorial material, and ads; Price $1.

Calendar

(Events listed below are subject to cancellation without notice)

MAY 1-2—3d New England Aviation Conference, Providence, R. I.

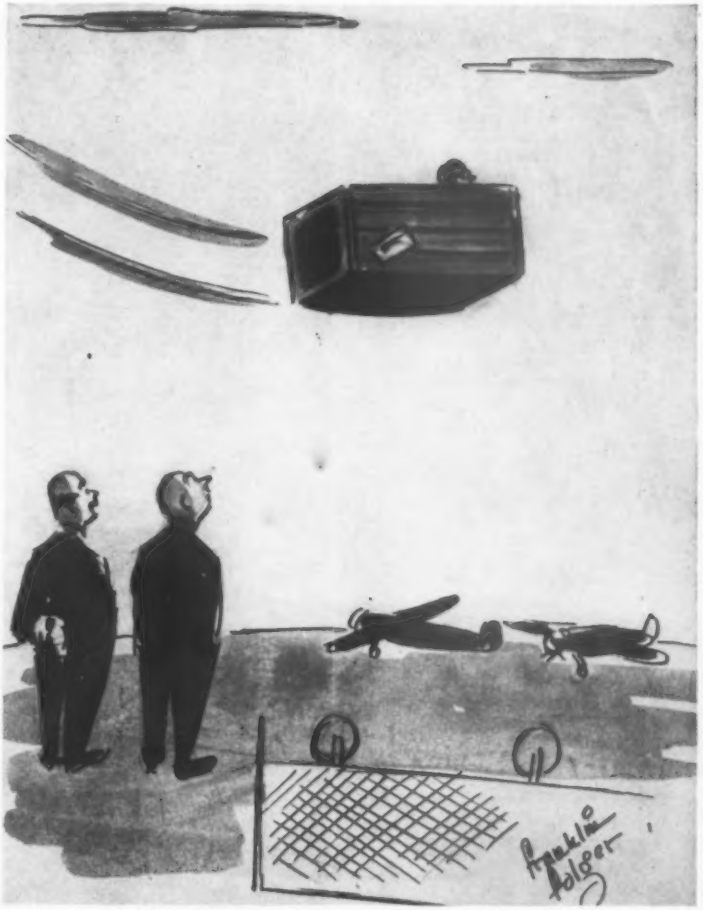
MAY 19-20—National Metal Trade Association, Annual Convention, New York, N. Y.

MAY 31-JUNE 5—Society of Automotive Engineers, Semi-Annual Meeting, Greenbrier Hotel, White Sulphur Springs, W. Va.

JUNE 8-10—American Society of Mechanical Engineers, Semi-Annual Meeting, Cleveland, O.

JUNE 22-26—American Society for Testing Materials, 45th Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

OCT. 12-16—National Metal Congress and Exposition, Detroit, Mich.



"I told you he could fly that old crate!"

Letters

Exhibit B

Apr. 17, 1942

The editorial in the Mar. 15 issue of AMERICAN AVIATION regarding the Army's method of assigning technicians to duty not in line with their training and experience might well be followed by a series of such editorials. The editorial cited the case of an airline mechanic assigned to duty as a cook.

Yesterday a graduate of our school paid us a visit. For a year and a half he has been working as a meteorologist for one of the Pan American subsidiaries in South America. Prior to this job he worked for a year in the meteorology department of one of the domestic airlines.

Before enrolling for training with this school he had taken two years of pre-engineering at a good college. While he was here, he had more than 3,800 hours of aeronautical engineering with a major in meteorology and a minor in radio.

The first of this year he gave up his good job in South America and returned to enlist in the Air Corps. He signed up early in February—and he is still dangling. He has been told that "when the next classes start" he will be assigned for cadet training.

Now, to tie this up and make it a perfect illustration of governmental stupidity: A day or two before the young man visited here another chap who said he was a special representative of the Civil Service Commission called and pleaded with us to give him the names of any men we knew who possessed some knowledge of meteorology and who could be employed as civilian instructors to be assigned to various Army air fields.

I believe that without much effort you could find enough such examples to blast high Army officials and Selective Service into taking intelligent action in utilizing the trained men now available.

R. A. A.

3 Plants Completed

STUDEBAKER Corp. reports through its president, Paul G. Hoffman, that its three plants for the manufacture of Wright airplane engines have been completed, the major portion of equipment has been installed, operations have commenced and "will increase so that within a few months employment in the aviation division alone will exceed the normal employment in Studebaker's automobile factories."

Method of Curbing Profits Undecided

Vinson Revamps Bill Pending in Naval Affairs

By KATHERINE E. JOHNSEN

COMMITTEE-room talk on Capitol Hill reveals that Washington is determined to prevent a recurrence of World War I profiteering, but "how" was a hurdle yet to be crossed as this issue went to press. The executive branch of the government advocates excess profits taxation and compulsory renegotiation of contracts in instances where unreasonable profits are spotted; Congressional leaders fight for enactment of a profit limitation law.

The President took a direct step by issuing an order (under authority given him by the recently approved Second War Powers Act) delegating his privilege of investigating the books of government contractors to the WPB, War Dept., Navy Dept., and other governmental agencies letting out contracts "in order to prevent the accumulation of unreasonable profits . . ."

Meanwhile, department heads (including WPB Chief Nelson, Secretary Knox, Under Secretary Forrestal, and Admiral Land) declaimed the "method" of recapturing profits

An Italian Plane Set Afire in Libya

Most of the Craft Left Behind Contained 'Booby Traps'

carried in the original Smith-Vinson bill at House Naval Affairs hearings, and House and Senate leaders conferred on a profit control "rider" to the Sixth Supplemental Appropriation bill.

The conferees compromised with a comparatively mild profit-control "rider" to the 19-billion-dollar Sixth Supplemental. The formula, similar to the profits amendment adopted by the Senate (in lieu of the flat 6% limitation amendment tacked on by the House) would vest specific power in the Secretaries of War and Navy and the Chairman of the Maritime Commission to compel submission of cost data or renegotiate contracts if necessary, to recapture excessive war profits.

Authority to determine what constituted excessive profits would be left to these agency heads. Conferees have privately conceded that the formula is largely a statutory restatement of present departmental profit-control practices and the President's Executive Order.

Bill Revamped

House Naval Affairs hearings resulted in a revamping of the original Smith-Vinson bill which limited profits to 6% and suspended for the duration of the war all labor legislation qualifying hours of employment and overtime compensation. Chairman Vinson (D., Ga.) deferred a Committee vote on his substitute until April 27, after Committeeman Flaherty (D., Mass.) narrowly missed side tracking the Vinson measure for another 30 days.

The Vinson substitute is much more lenient than the original bill. Main changes are as follows:

1. The substitute bill would apply to all war contractors. The original bill applied only to Naval contractors.

2. Profits would be limited to 8% of cost of contracts, instead of the original 6%.

3. There would be a $6000 "cushion" on all contracts over $100,000. This means that on a $100,000 contract, the contractor would be entitled to 8% of $100,000 (or $8000) plus $6000—a total of $14,000 or an equivalent of 14% profit. On a contract of $1,000,000, the contractor would be entitled to 8% of $1,000,000 (or $80,000) plus $6000—a total of $86,000, or an equivalent of 8.6% profit. This provision has somewhat the same effect of the "sliding scale" of profit-control (graduating profit limits from 10% on $100,000 to 2% on all over $50,000,000) advocated by the Senate sub-committee when considering the Sixth Supplemental.

4. The work-week ceiling is set at 48 hours with 1½ compensation for all hours over 48.

5. The Secretary of the Treasury is authorized to amend from time to time the provisions of Treasury Decision 5000 (enumerating the items chargeable to the cost of a government contract).

6. The "closed shop" situation is frozen. The original bill eliminated "closed shop" for labor.

7. Maximum union initiation fee is set at $5. Maximum rate of dues is set at $2 per month. Provision is included that Unions cannot discharge members for being in arrears in payment.

8. A production "bonus" plan is authorized. The Secretaries of War and Navy and the Chairman of the Maritime Commission are authorized to appropriate government funds for production "incentive bonuses" for employees on government contracts.

Toland Continues

Meanwhile investigation into profits is left to Washington attorney Edmund M. Toland, Chief Counsel of the Naval Affairs Investigating Committee. Toland says that $150,000,000 has already been refunded the government through renegotiation of contracts, $9,000,000 of which was from Jack & Heintz Inc. of Cleveland (manufacturers of airplane starters), whose executives were quizzed by Toland at a hearing on Mar. 23.

Next on Toland's calendar are Maj. Reuben H. Fleet, formerly president of Consolidated Aircraft Corp., Ernest Breech, formerly vice president of General Motors and now president of Bendix Aviation Corp., and Vincent Bendix, president of Bendix Aviation Corp.—all scheduled for a hearing on Apr. 30. Toland will examine Glenn L. Martin before the Naval Affairs Committee sometime in May.

Toland last week filed for the record of the committee a listing of the compensation for the years 1938, 1939 and 1940 of the chief executives of leading government contractors, indicating percentage of increase or decrease in salary between 1938 and 1940. No aviation executives showed a decrease in remuneration in 1940 as compared with 1938, but executives of a few other concerns did.

In general, however, salaries were higher in industries other than aircraft manufacturing. Toland points to 1940 as a year in which effects of government business were evidenced. Only salary in aviation which Toland specifically called to the Committee's attention was that of Donald W. Douglas, president of Douglas Aircraft Corp. Douglas' salary, Toland said, showed an increase of 72.86% in 1940 over 1938. In 1938 Douglas earned $43,433, in 1939 this was raised to $64,683, and in 1940 went up to $75,080. Other aviation executives whose salaries showed increases of over 50% in 1940 in the report submitted to the Committee were:

	Salary, 1938	Salary, 1939	Salary, 1940	Percentage Increase
Grumman Aircraft Engineering Corp.				
L. R. Grumman	$26,535	$26,580	$42,096	58.63
L. A. Swirbul	21,535	21,580	37,096	72.26
Wm. T. Schwendler	12,250	16,040	18,699	52.65
Consolidated Aircraft Corp.				
R. H. Fleet	19,325	20,025	35,942	85.99
I. M. Laddon	16,825	18,025	25,630	52.33
Glenn L. Martin Co.				
Glenn L. Martin	25,180	33,970	40,200	59.65
H. T. Rowland	11,545	16,180	17,600	52.4

Lee Brutus of Waco to Head Reorganized Luscombe Company

LUSCOMBE Airplane Corp., West Trenton, N. J., for the last two months operated under "freezing control" of the U. S. Treasury pending an investigation of the company's management, will be reorganized, Leo T. Crowley, U. S. Alien Property Custodian, announced in mid-April.

Leopold H. P. Klotz, principal stockholder, has been removed under the "trading with the enemy act."

Matthew J. Hickey Jr., Chicago, was made chairman of the board of directors; Lee N. Brutus, Troy, O., vice-president of Waco Aircraft Co., was named president and general manager in charge of the West Trenton plant and the corporation's ground schools in West Trenton and Dallas.

J. H. Torrens, former Luscombe president, will remain as vice-president.

Plans were announced for expansion of the plant and facilities for quantity production of naval aircraft parts, as well as Navy trainers.

MICA INSULATED SPARK PLUGS

Patented in the United States and other Countries

Contractors to the United States Army, Navy and Coast Guard and Aircraft Engine Builders.

THE BG CORPORATION

136 W. 52nd Street New York

The B.F. Goodrich Airplane of the month

CONSOLIDATED B-24

High, wide and handsome is a perfect description of Consolidated Aircraft's famous B-24 Bomber. Because this huge 4-motored plane is capable of reaching great altitudes —carrying tremendous bomb-loads—and is a handsome performer in every way!

The B-24's take-offs and landings are made on B. F. Goodrich Airplane Silvertown Tires. It accomplishes safe, smooth braking, thanks to B. F. Goodrich E. T. Brakes. The leading edges of its great wings are guarded against icing by B. F. Goodrich De-Icers . . . its fuel supply is protected by our Self-Sealing Fuel Tanks.

Consolidated's B-24 is our choice for Plane of the Month.

The Army flies with
B.F.Goodrich
FIRST IN RUBBER

B.F. GOODRICH RUBBER RESEARCH FOR THE *Aviation industry*

NEW RUBBER FEED SHOE FOR PROPELLERS GREATLY INCREASES PROTECTION AGAINST ICE

THE GOAL of modern aircraft has been to fly higher, faster, more efficiently, and this has led to larger propellers, lower RPM. Because of this, pouring *anti-freeze* fluid on the inner end of the blades will not carry it far enough out on the leading edges of a propeller to afford sufficient protection. To overcome this problem, B. F. Goodrich recently developed the propeller anti-freeze feed shoe, which is affixed, by the Goodrich Vulcalock process, to the leading edge of a propeller blade.

The B. F. Goodrich propeller feed shoe is a carefully designed tapering strip of rubber. It is cemented, as mentioned, to the leading edge of the propeller blades. At the wide end, which fits directly under the feed pipe from the slinger ring, are several small grooves. These grooves pick up the anti-freeze fluid as it is spilled and carry it the full length of the shoe. The base grooves, as they run toward the tip, merge into a single groove, so designed that just the right amount of fluid is conveyed and just the right amount overflows. Thus the propeller edge is constantly bathed in the protective fluid.

Years of painstaking research have gone into the design of this shoe. One major airline with a serious year-round icing problem adopted this product as standard equipment as soon as it was introduced commercially. At present *four* major airlines are using it on all planes.

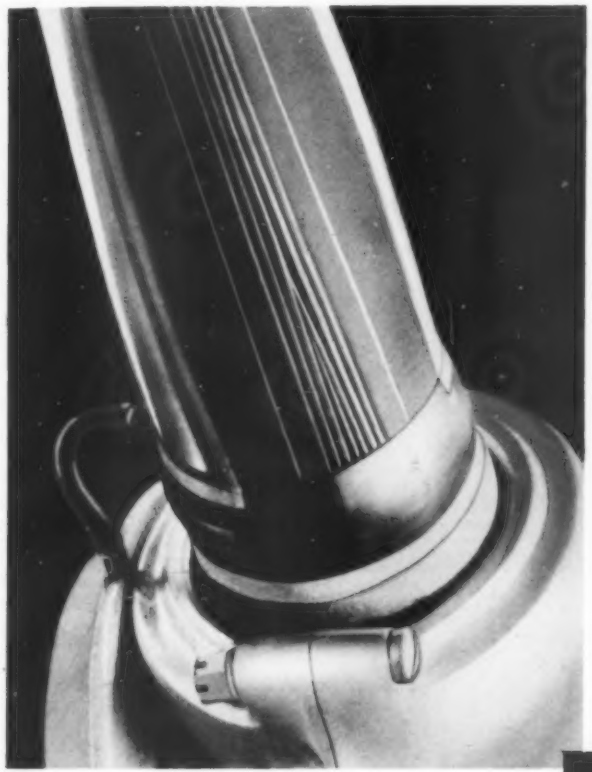
The advantages of this shoe, other than the fact that it permits a plane to fly safely through more severe icing conditions than heretofore, are: 1) Reducing of propeller vibrations by keeping ice off; 2) reducing the amount of alcohol a plane must carry; 3) preventing damage to sides of a plane by removing ice in smaller pieces; 4) preventing sand abrasion and water erosion on the leading edges of a propeller.

For information, write B. F. Goodrich, Aeronautical Div., Akron, Ohio.

MAKERS OF B. F. GOODRICH TIRES AND OVER 80 RUBBER AND SYNTHETIC RUBBER PRODUCTS FOR AIRPLANES

A quick picture of

RUBBER FEED SHOE INSTALLATIONS

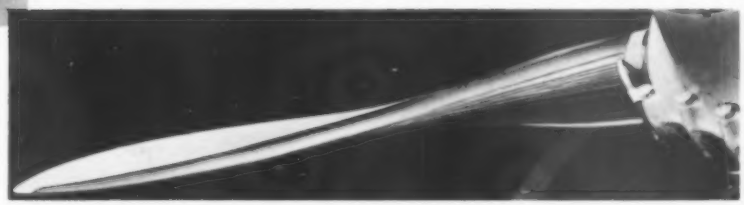


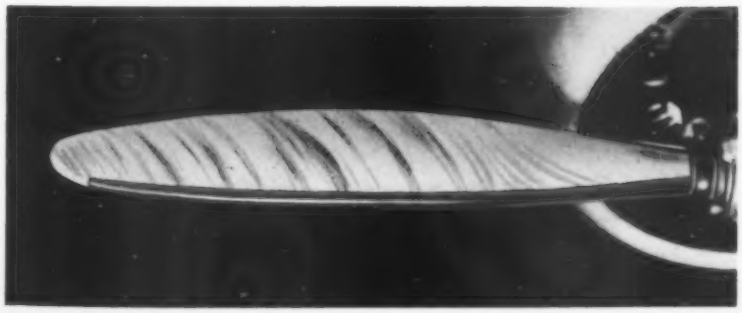
THE LATEST TYPE of B. F. Goodrich propeller anti-freeze feed shoe, as it is now used by Trans-Canada Air Lines. Note the slinger ring and hose connection to the feed ring.

★ ★ ★

A TYPICAL PROPELLER feed shoe installation, without the feed ring, is shown in picture at right.

THE ARRANGEMENT of the grooves at the blade root of the B. F. Goodrich propeller feed shoe is designed to convey the fluid along the leading edge.





THE FLOW PATTERN of the anti-freeze fluid is demonstrated on the cambered face of this propeller blade. In order to photograph, the fluid was colored and a test flight made. It will be seen that the fluid is distributed over the entire blade-face.

In war or peace

B.F. Goodrich

FIRST IN RUBBER

THIS POWER TOOL INCREASES SPEED OF "BLIND RIVET" INSTALLATION 400%

Speeding up aircraft production with rivets that can be headed and upset from one side is the job that B. F. Goodrich Rivnuts are now doing for manufacturers and maintenance crews everywhere! This "blind" rivet is made of a highly corrosive-resistant aluminum alloy. A new power tool developed by the Chicago Pneumatic Tool Company in cooperation with B. F. Goodrich engineers speeds installation by over 400%. Wherever a "blind" rivet is called for, use B. F. Goodrich Rivnuts.

B. F. GOODRICH SILVERTOWN TAIL WHEEL TIRES

B. F. Goodrich pneumatic tail wheel tires are designed to withstand the terrific shocks and the sudden twisting strains placed upon them in all types of landings.

A complete line of tread designs is available, corresponding to the tread designs that are built into the tires used on landing wheels.

Solid rubber tail wheels are also available. They are cured into a heat-treated aluminum alloy hub, which is recessed to accommodate the solid rubber; they come already equipped with bearings. Also—a special Zero Pressure tire is made with a cavity that helps to cushion landing-shock.

B. F. GOODRICH SILVERTOWN TUBES

B. F. Goodrich Silvertown Airplane Tubes have high tensile strength, and are designed to resist tearing and provide maximum elasticity with minimum of air loss. They are made of a special heat-resisting compound.

B. F. GOODRICH · AERONAUTICAL DIVISION · AKRON, OHIO

Mfrs. Save U. S. $124,000,000 On Volume Aircraft Contracts

Returns Expected To Be Allocated For More Planes

By FRANKLIN H. STEVENSON

AIRCRAFT manufacturers' efficiency is paying big dividends to Uncle Sam.

In a few recent announcements, savings of $124,000,000 are revealed and the unrevealed figures probably run up into the hundreds of millions of dollars.

For instance: there is the well-publicized repayment of $40,000,000 by Continental Motors; North American announced that $14,000,000 was being returned to the government and contracts prices being reduced another $60,000,000; and United Aircraft gave back $10,000,000.

In addition, Boeing announced that the cost of Flying Fortresses was being revised downward and Fairchild Aviation has advised the government that where costs are out of line with prices previously quoted, the company expects to reduce future prices to adjust this condition.

Total is Unknown

These are only a few instances which were made public. The actual dollar totals of savings are probably so large as to make any guess work as to their amount hazardous.

These savings were attributed to a number of causes. For example:

Continental said the reduction was made possible through "increased efficiency, plant economies, improvements in methods and the wholehearted cooperation of its employes."

North American was "pleased to announce that in addition to the outright gift of $14,000,000 previously announced on planes now in process, we shall be able to save almost $60,000,000 for the government by a voluntary price reduction on large quantities of training planes contracted for but not yet in process.

"Although the costs of labor and materials are higher now than when the contracts were negotiated, we find that increased efficiency makes it possible for North American to build combat training planes at approximately 66% of the cost of those same planes in the summer of 1940. A large share of the credit for increased efficiency must go to the Army and Navy standardization programs. We like to think, however, that some of the credit belongs to the ingenuity and diligence of our manufacturing organization . . . It represents rather forcefully the continuing trend toward manufacturing efficiency."

United Aircraft explained that "costs were lower than anticipated, even though labor rates sharply increased."

Boeing reported that its saving was due to "quantity production and completed facilities of buildings and equipment."

Fairchild Aviation said that "the unusual volume of business received has in many cases enabled the company to reduce costs and overhead materially."

All of these statements add up to one well-known fact—that mass production fosters tremendous savings per unit even in an item such as an airplane, which in many cases is practically "hand tailored."

It may be safely predicted that with the automobile companies entering the aircraft field as a result of the war, even more savings will result through new processes, substitutions, developments, etc. Automotive engineers have long been trained in just such work and any results they may achieve will probably be adopted by the aircraft industry.

All of these factors put together will mean one of two things to the war effort—either that the airplane program will cost a lot less than was anticipated, or that the government will get considerably more airplanes for its dollars than were forseen when present contracts were placed.

(A hint of what may occur may be found in the North American announcement that the $14,000,000 returned to the government "was immediately allocated by the War Dept. to order more planes."—*Ed. Note*).

In either case, it should be good news for the taxpayer.

Closed Shop?

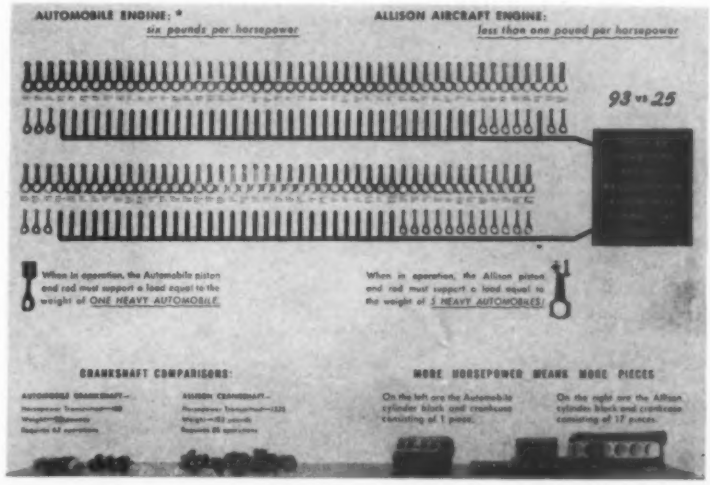
"Prison walls do not a prison make" may take on new meaning if the Department of Justice authorizes penitentiary inmates to turn out aircraft in flyaway condition. The Department has issued from its cloistered walls in Washington the announcement that an Army ordnance contract has been awarded to the Lewisburg, Pa., federal penitentiary for manufacture of metal fins for aerial bombs.

Industry experts, worrying amout the coming labor shortage, foresee the next step—aircraft workers wearing stripes.

(Sen. Truman is already naming a special excess profits subcommittee to clamp down on the wardens).

2 Firms Indicted

AQUA SYSTEM INC., New York City, and Flotation System Inc., Los Angeles, pleaded innocent to a two-count indictment charging violation of the Sherman Anti-trust Law in New York City recently. Trial was set for May 20. The corporations manufacture gasoline storage and fueling equipment for airports and were charged with restraint of trade and conspiracy to monopolize in restraint of trade.


AUTOMOBILE ENGINE: *
six pounds per horsepower
ALLISON AIRCRAFT ENGINE:
less than one pound per horsepower
93 vs 25
When in operation, the Automobile piston and rod must support a load equal to the weight of ONE HEAVY AUTOMOBILE.
When in operation, the Allison piston and rod must support a load equal to the weight of 5 HEAVY AUTOMOBILES!
CRANKSHAFT COMPARISONS:
MORE HORSEPOWER MEANS MORE PIECES
On the left are the Automobile cylinder block and crankcase consisting of 1 piece.
On the right are the Allison cylinder block and crankcase consisting of 17 pieces.

93 vs. 25: Prepared by General Motors Corp., this table graphically illustrates operations necessary in the manufacture of airplane engines which are not necessary in auto engines. The comparisons are based on the Allison airplane engine and the Cadillac engine. In the case of connecting rods, 93 operations are required on the Allison vs. 25 on the Cadillac. The Allison powerplant delivers nine times as much horsepower as the Cadillac engine.

Globe Aircraft Corp. to Make Beechcrafts Under Special License

GLOBE Aircraft Corp., Ft. Worth, Tex., has arranged to manufacture Beechcraft trainers under a special license with Beech Aircraft Corp., Wichita, Kan., it was reported in mid-April.

John Kennedy, president of the firm, in January received an $18,500,000 War Dept. contract for transitional trainers, but since Globe had no suitable plane of its own, Kennedy arranged to make Beechcrafts.

Globe also holds a $400,000 contract to make fins and stablizers for Beech aircraft, Beech supplying all the materials.

John R. "Jock" McLean, son of Evalyn Walsh McLean of Washington, and his wife, are reported to own 16% of Globe's stock; Kennedy holds 17%.

Franklin's 4-Cylinder Geared Unit Gets TC

FRANKLIN'S 4-cylinder geared aircraft engine, manufactured by Aircooled Motors Corp., Syracuse, N. Y., has completed TC tests and

has been rated at 115 hp. for take-off at 2,200 rpm. propeller speed.

Known as Model 4ACC-199, the engine is of the horizontally opposed type, aircooled, wet sump. Standard finished unit is equipped with electric starter and solenoid starter switch, engine driven generator with two-stage voltage regulator and cut-out, dual magneto ignition, breather pipe, carburetor, exhaust flanges, and gaskets.

Dry weight is 248 lbs.

New Material Produced for Bushings and Guides

FIRESTONE Tire & Rubber Co. has developed a new material to be used for bushings and guides of the primary controls of airplanes—a composite construction of a special rubber compound, a special cotton fabric and a new method of impregnating the assembly after vulcanization.

Because of its elastic properties, bushings and guides of this new material provide, without restriction of action, a tighter fit than has previously been possible with conventional type guides and bushings. Combining shock absorption qualities and the ability to minimize lost motion, it contributes to smooth and stable operation of the plane.

The new material is being used principally in bushings and guides for rudders, elevators and ailerons.

On the Labor Front

AIRCRAFT MECHANICS INC., Colorado Springs, Colo.
The Department of Labor has appointed a conciliator to settle a controversy among employes and avoid possible work stoppage.

BARBER-GREENE CO., Aurora, Ill.
IAM-AFL members' request for ruling on wage rates, union security, and night rate bonuses has been certified to NWLB. 400 workers involved.

BENDIX AVIATION CORP., Wayne, Mich.
NLRB has ordered an election among production and maintenance employes to determine if they want to be represented by UAW-CIO.

BUFFALO FORGE CO., Buffalo, N. Y.
NLRB Trial Examiner Hektoen has filed intermediate report recommending company reinstate two workers discharged because they had joined a union, with remedial back pay. At same time, a charge of unfair practices against the company was dismissed.

BUICK MOTOR CAR CO., Flint, Mich. (Aviation plant)
U. S. Committee on Fair Labor Practices has ordered the company to cease discriminatory hiring practices.

CURTISS-WRIGHT CORP.
Regional director of NLRB has issued a complaint accusing two propeller plants in New Jersey of fostering a company union and discouraging membership in AFL.
A "no strike" contract providing wage increases of 5c to 13c an hour had been signed with propeller craft, an independent union on Feb. 24. Last August a seven-day strike was conducted at the plants by IAM-AFL at which time charges were made that the company had been guilty of unfair labor practices within the meaning of the Wagner act.

GOODYEAR AIRCRAFT CORP., Akron, O.
A special mediation hearing will be held at Washington by NWLB on a labor controversy involving 1,300 UAW-CIO workers making airplane parts. A previous general hearing was recessed Feb. 28.

GOODYEAR TIRE & RUBBER CO., Akron, O.
A "wildcat" strike in protest against a pay rate change by 440 employes of the fabricating department was ended by labor conciliators, restoring the flow of rubberized material to several thousand Goodyear employes producing balloons, blimps, rubber boats, and bullet-sealing gasoline tanks.

W. L. MAXSON CORP., New York, N. Y.
Trial Examiner Spencer of NLRB has filed an intermediate report instructing disestablishment of Independent Association of Instrument Workers as collective bargaining agent for all employes.

MICHIGAN WIRE CLOTH CO., Detroit, Mich.
Company has signed UAW-CIO union shop agreement.

PARKER APPLIANCE CO., Cleveland, O.
In a supplemental order to that of Mar. 6 when NWLB directed the company to pay a bonus of 9% of employes' base pay for the third quarter of 1941, the company was directed to pay a similar bonus to employes who worked between June 30 and Oct. 31, 1941, and who have entered the armed services.

REYNOLDS METALS CO., Longview, Wash.
Demands of 440 workers of the Federated Aluminum Council AFL for wage increases has been certified to NWLB.

ROLLER BEARING CO., Trenton, N. J.
Paul Sanders, principal mediation officer of NWLB has conducted a preliminary investigation into demands of 314 UAW-CIO workers for union security and wage increases. Board will consider his findings and probably set a date for a hearing in Washington.

SHELL OIL CO.
Thomas F. Neblett has completed a special investigation in controversy between company and members of the Oil Workers International Union CIO. Case will now be heard by NWLB.

SPERRY GYROSCOPE CO. INC., Brooklyn, N. Y.
Having completed preliminary hearings in New York City, the case is now before a special NWLB panel in Washington.

STEWART-WARNER CORP., Chicago, Ill.
U. S. Committee on Fair Labor Practices has ordered the company to cease discrimination in hiring.

THOMPSON PRODUCTS CO., Cleveland, O.
NLRB has directed the company to hold an election among employes for bargaining representation. CIO had petition distributed asking for election.

WALKER TURNER CO. INC., Plainfield, N. J.
NWLB resolved a union security between the company and UER&M-CIO by directing that members who have dropped out of union since last Nov. 27, be required to rejoin. The decision also required enforcement of rule of the union for company collection of dues, assessments and fines.

War Labor Agreement Is Signed at Solar Aircraft
Participants: Company Men and Employe Representatives

Personnel in the News

P. V. Ogden

Perry V. Ogden has been appointed factory manager and general superintendent in the manufacturing division of Boeing Aircraft Co.'s Seattle plant. Under him on Fortress production are **Leo Castle** and **Jay Morrison**, who will continue in their positions as assistant general superintendent and production manager, respectively.

W. S. Patterson has been elected treasurer of Bowlus Sailplanes Inc., San Fernando, Cal., succeeding **M. G. Scudder** who retains the position of president and general manager. Vice presidents are **William Hawley Bowlus** and **Dwight Whiting.** Secretary of the company is **Victor Ford Collins.**

A. M. Hall, general manager of Consolidated Aircraft Corp.'s Ft. Worth plant, has returned to Texas from a conference with Ford Motor Co. representatives at the Willow Run bomber plant in Ypsilanti, Mich.

Edward G. Miller, formerly with Air Associates Inc., has joined the staff of Emerson Electric Manufacturing Co., St. Louis, as sales engineer, specializing in electric motor controls for aircraft.

Harry A. Walker, who joined Lockheed Aircraft Corp.'s finance department in 1937, has been named to succeed **Henry H. Ogden** as manager of the British re-assembly division. **Dan Gribbon** has assumed the title of assistant manager and will be in charge of operations. Ogden was recently appointed foreign manager of project No. 1 of Lockheed Overseas Corp.

Adoption of a supervisory system of production control has been announced by Aircraft Mechanics Inc., Colorado Springs, Colo., with the appointment of eight men as departmental supervisors by **Proctor W. Nichols,** president. The men are **Frank Walker,** maintenance; **Glenn Hahnenkratt,** machining; **Ray Perrill,** tube forming; **W. L. Marple,** sub-machining; **C. A. Kiefer,** welding; **Sam W. Stout,** sand blasting; **James W. Wilson,** inspection; and **Lyman Ryan,** jig and tool department.

Randolph C. Walker, president of Aircraft Accessories Corp., Burbank, Cal., is now personally undertaking the general managership of Aircraft Accessories Corp. of Missouri, at Kansas City, Kan. **James A. Habegger,** treasurer of the parent company, and other personnel, have been transferred from California, to become executives of the midwest plant.

J. H. Matthews and **O. H. Cilley** have been elected to the board of Raybestos-Manhattan Inc. Matthews is assistant general manager of Manhattan Rubber Manufacturing Division, and Cilley is assistant general manager of United States Asbestos Division.

James K. Fulks has been elected vice president in charge of manufacturing of Ex-Cello-O Corp., Detroit.

John W. Castles, partner in the firm of Smith, Barney & Co., New York City, has resigned from the board of directors, Glenn L. Martin Co., to join the Army Air Forces as a major. Re-elected directors of the Martin company are **Glenn L. Martin, Joseph T. Hartson, Harry F. Vollmer, Howard Bruce, William K. Ebel, John W. Hanes, Myron G. Shook,** and **Thomas H. Jones.**

General Aircraft Corp., Lowell, Mass., announces election of officers and directors as follows: President, **Harlan J. Maynard Jr.;** vice presidents, **Otto C. Koppen** and **Harris Fahenstock Jr.;** treasurer, **Joseph T. Geuting Jr.;** secretary, **K. Ian Deane.** Directors: **Walter S. Orr, Harry L. Kirkpatrick, Koppen, Geuting,** and **Maynard.** The company also announces appointment of **William J. Faso** as general factory manager, and of **Edward S. Gremse,** formerly with the WPB, as comptroller.

The following directors of Sperry Corp. have been re-elected: **Thomas A. Morgan, George N. Arnsby, J. Cheever Cowdin, Thomas B. Doe, Charles T. Fisher, Frank T. Hines, Lindsey Hopkins, E. A. Pierce,** and **John Sanderson.**

Memphis Firm Set

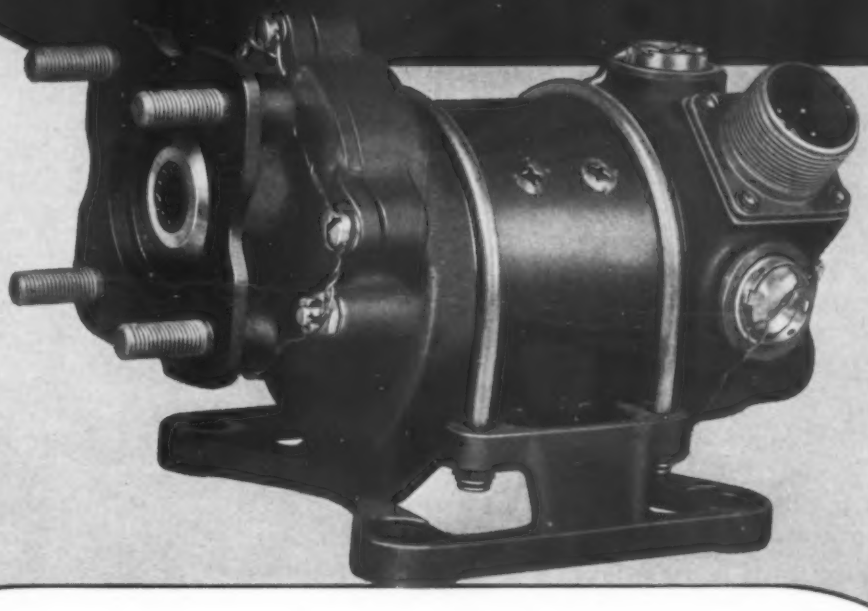
AIRCRAFT PRODUCTS Inc., a new organization, expects to begin operation May 1 at Memphis to fabricate exhaust manifolds, landing gear, motor mounts, tail wheel assemblies, and other welded parts for aircraft. Officers are Edward M. Knoff, president; J. Ed Johnson, vice-president; Jack W. S. Boone, secretary and plant manager; and Wayne Barros, treasurer and superintendent of production.

Cooperation

BOEING AIRCRAFT Co. of Seattle has turned over to Consolidated Aircraft Corp., San Diego, comprehensive information on the organization and methods of its flight and aerodynamics department, to aid the California company in establishing a similar test program. Eddie Allen pioneered the Boeing program of systematic flight testing. Ernie Stout is chief of the Consolidated unit.

A lightweight motor that does a heavyweight job

DELCO FUEL PUMP MOTORS



Delco explosion-resistant motors for aircraft fuel pump applications conform to latest military aircraft requirements. Their compact, lightweight design meets space-and-weight limitations . . . qualifies them for important jobs in modern bomber, fighter and pursuit planes.

Delco fuel pump motors for engine starting and transfer duty are now in volume production. Delco Products' engineering, research and manufacturing facilities are co-ordinated to provide quick action in the development of electric motors for other aircraft applications.

DELCO MOTORS

DIVISION OF GENERAL MOTORS CORPORATION

DELCO PRODUCTS DAYTON, OHIO

Fairchild Reveals Plan for Multi-Engine Ship; Reports Peak Output of Metal Substitute

EXTENSIVE research work, a secret multi-engine transport, and augmented production of aircraft made from molded and synthetic resin are announced in the annual report issued by Fairchild Engine & Airplane Corp.

In one of the most comprehensive statements issued by any aircraft manufacturing concern since beginning of hostilities last December J. Carlton Ward, Jr., president, reveals to stockholders the following developments during 1941:

(1) Consolidated net income was $541,079, against a deficit of $60,771 in 1940. Provision for taxes was $1,217,571, against $21,727. Consolidated profit from operations of the Aircraft and Ranger Aircraft Engines Divisions, and a wholly-owned subsidiary, Duramold Aircraft Corp., was $1,658,676 (before taxes) against $57,860 in 1940.

(2) The Model 24, 4-place commercial ship, has been adopted with minor modifications as the Army's C-61. "It is being used by the British and the American forces in substantial quantities (as a cargo and liaison plane) and continued production is to be provided for." This model is being used in several important combat areas.

More and More Trainers

(3) The primary trainers, PT-19 and its derivative the PT-26 (Cornell), "are being used in greatly increasing numbers for . . . our air force cadets." The two ships vary only in the increased power of the Cornell from 180 to 200hp., and the addition of a cockpit enclosure and complete radio and instrument installations. "This airplane (P-26) . . . was selected by the Canadian military authorities for manufacture in Canada under license for both the RCAF and RAF." Brazil, Chile, Ecuador and Salvador have acquired the PT-19 and negotiations are under way for its license or sale to additional countries. Also using the PT-19 are the Royal Norwegian Forces in Canada, and the Peruvian forces.

The Fairchild 24

Adopted As the Army's C-61

Under a government plan, Fairchild has licensed three U. S. aircraft companies to manufacture the PT-19, necessary "because of the increased demands for this airplane by our government."

"This plane was originally designed to require a minimum of strategic materials. By a re-design, providing for the use of Duramold, . . . it has been possible to carry out this objective even further."

Using Piano Plant

(4) Production quantities of Duramold are now under construction for fighting planes through extensive use of a piano plant, as well as facilities installed in the Aircraft Division and to be installed at a new southern plant. Duramold is now being used in a large Air Forces contract for a confidential type of multi-motored airplane soon to be tested.

(5) Confidential developments in high altitude performance are being made and if successful will be available to the entire aircraft engine industry. Other developments, carried on by two scientists in collaboration with the Ranger staff, have already resulted in important improvements in engine cooling.

(6) Extension of the original plant of the Ranger Aircraft Engines Division has been completed and a further extension in another locality is being negotiated to produce both the six cylinder in-line air-cooled type and the 12 cylinder type for the Navy's scout-observation plane, the SO3C-1 built by Curtiss.

(7) Extensive work on sub-contracts in large metal structures for combat planes is reported and placement of sub-contracts in woodworking and other non-defense fields have aided in stepping up production.

(8) Employment of several hundred women workers has proven successful and justifies the plan to employ up to 50% of women in both aircraft and engine manufacture as military demands narrow the male labor market.

Balance sheet as of Dec. 31 showed assets $12,311,506; current assets $7,095,845; current liabilities $2,825,210; capital stock $1,711,324; paid-in surplus $446,796; earned surplus $272,486.

Britain Producing 80% of RAF Planes

Despite losses inflicted on its productive capacity by heavy German bombings since beginning of the war, Great Britain is still providing more than 80% of the aircraft used by the Royal Air Force pilots fighting in all parts of the world, according to a statement made by Oliver Stewart, BBC air commentator in London, Apr. 6.

"In the (London) metropolitan area," he said, "the proportion of British to all other kinds of aircraft is still nearly 90% . . . Overseas, where U. S. aircraft have been coming into service in rapidly increasing numbers, the proportion of British machines of all types is still nearly three quarters of the total."

Mfg. Digest

GRUMMAN AIRCRAFT Engineering Corp., Bethpage, N. Y., has named L. E. McGivena & Co., New York City, to handle its advertising account.

GOODYEAR AIRCRAFT Corp. is reported to have begun construction of a large plant in the Akron vicinity for the production of completed airplanes.

BOEING AIRCRAFT of Canada Ltd., Vancouver, B. C., now has a backlog exceeding $30,000,000. The Canadian subsidiary of the Seattle, Wash., parent company is in production on PBY flying boats. Employment totals 3,000.

ELGIN NATIONAL Watch Co., Elgin, Ill., is at work on several million dollars worth of Army and Navy contracts for navigation watches, stop watches, aviation clocks, service watches, and special timing devices for use by the air arm of the services.

CHRYSLER CORP., reporting on its war production, states: "Our aluminum alloy forging plant is making duralumin aircraft forgings. Bomber parts are being produced in the various Plymouth, Dodge, DeSoto, and Chrysler plants. A large amount of equipment is already installed in our final bomber section assembly plant and assembly of fuselage sections has commenced."

SEALED POWER CORP., Muskegon, Mich., piston ring, sleeve, and pin manufacturer, has let a contract for an addition to expand production of aircraft piston rings.

NORTH AMERICAN AVIATION Inc. is offering $10,000 worth of U. S. Defense Bonds to employes in its Inglewood, Cal., Dallas, and Kansas City plants for acceptable production improvement suggestions.

Dynamotor Contactor Produced for Aircraft

A NEW contactor designed to start and stop dynamotors used with aircraft equipment has been announced by the industrial control division of General Electric Co., Schenectady, N. Y.

It is available for either 12- or 24-volt direct-current circuits, and conforms to the general requirements set up for aircraft control devices, according to GE's announcement.

GE's Dynamotor for Aircraft

Meets Signal Corps Requirements

The dynamotor contactor is approximately 2½ inches wide and 4 inches high, weighs 2.3 pounds, and can be mounted in any position. It is totally enclosed, with the contacts in the upper compartment and the coil and plunger in the lower compartment. Copper - lead - alloy contact tips are used to assure the best high-current inrush performance.

The contractor meets Signal Corps vibration requirements, being good for mechanical frequencies of 5 to 55 cycles per second at a maximum of 1/32-inch amplitude (1/16-inch total travel) applied in any direction.

The contact rating is 40 amperes on an 8-hour basis. Inrush current rating is 500 amperes at 32 volts direct current. Coil wattage is 9.5

WORLD'S PREMIER AIRPLANE FABRIC

LIGHTER STRONGER SMOOTHER

FLIGHTEX

SUNCOOK MILLS - 40 WORTH ST. - NEW YORK, N. Y.

Leading Manufacturers of Fabric and Tapes for the Aircraft Industry.

FLIGHTEX FABRIC

Export Representative - Aviation Equipment & Export, Inc., 25 Beaver St., N. Y. Cable Address — Aviquipo

CONTACT! — turn into the wind — and away goes the first silver squadron. Up into the bowl of the sky, wing-tip to wing-tip — up and away, almost as one 'plane, swift into the eastern sky till they seem but glistening pin-heads stuck in an azure band. Below on the sun-grilled earth great billowing clouds of dust float slowly across the airfield . . . . .

Dust — just dust. But a powerful and dangerous enemy. Our only weapon is filtration, and if full efficiency is to be maintained, if breakdowns are to be avoided and engine-life prolonged — then that filtration must be **perfect.**

FILTERS OF THIS TYPE ARE AVAILABLE FOR EASY FITMENT TO EXISTING AIRCRAFT

To-day, such filtration is no longer just an idea. Long months of research in the VOKES laboratories have made it an actual, proven fact. These VOKES filters, both for air and for high and low-pressure oil systems, are designed **on an entirely different principle of filtration.** Their efficiency — tested and proved under the strictest conditions — is 99.9% (filtration down to particles 0.00004 in. diameter.) This indeed is perfection. Human endeavour can go no further. Here at last is a guarantee of constant air and oil-purity no matter the conditions of service.

We shall be glad to answer all enquiries and arrange practical demonstrations through our agents.

VOKES

VOKES LIMITED - FILTRATION EXPERTS

American and Canadian Agent:
E. Cantin, 101 Park Av., New York

American Gets Mexico City Route As President Overides CAB Decision

War Needs Make Line Necessary, White House Says

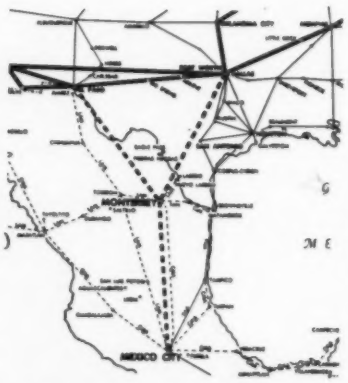
FOR THE first time, the President of the U. S. has refused to approve a decision of the Civil Aeronautics Board, with the result that American Airlines on Apr. 18 received a temporary certificate for a route from El Paso and Ft. Worth-Dallas to Mexico City via Monterrey, Mexico.

The CAB decision, as sent to the White House for approval on Feb. 20, turned down the AA application by a vote of 4-1, CAB Chairman L. Welch Pogue dissenting.

The President, however, refused to approve, and "indicated" that in the interest of "urgent war needs" the company should receive the certificate.

Throughout hearings on the application, AA's proposals were bitterly opposed by Pan American Airways. PAA claimed that it can furnish all necessary service, including the establishment of an airway.

Following the award, AA President A. N. Kemp announced that the company intends to inaugurate service on the route within six months. Construction of an airway and airports will be necessary.



A New Route for War Needs

In its decision issued Apr. 18 (the original unfavorable decision was not released) the Board pointed out that in the case of *Pan American Airways vs. Civil Aeronautics Board and American Export Airlines*, the U. S. Circuit Court of Appeals said: "It seems clear that in approving or disapproving of certificates of public convenience and necessity the President must frequently act on information which was not before the Board and may even have become available to him after the Board has taken its testimony and granted the certificate."

Defense Factor

The Board said that the needs of national defense "will be adequately met by a temporary certificate to be continued in force until such time as we shall determine that the need in the interest of national defense for its continued effectiveness no longer exists."

Under these circumstances, the Board deferred investigation to determine whether the cities of Laredo, Eagle Pass, and San Antonio should be included on the route.

Approval of acquisition of control of American Airlines de Mexico by American Airlines Inc. is not required, and therefore AA's application for such approval was dismissed, CAB said.

Modern NWA Office: Northwest Airlines recently opened a new sales and traffic office in the Yale Bldg., Billings, Mont., Office paneling is made of matched grain walnut and the interior walls are of rawhide. Six murals, depicting the history of transportation, hang on the walls. Office is under the direction of H. L. Cummings, NWA's Montana traffic manager.

Re-Elects Directors

At the recent annual meeting of Eastern Air Lines stockholders in Wilmington, Del., the following directors were re-elected:

Col. E. V. Rickenbacker, president and general manager; T. F. Armstrong, Adolf Garni, Hugh Knowlton, J. W. Moore, John H. Phipps, and Laurance Rockefeller, all of New York City; Edward G. Romfh and S. L. Shannon, of Miami; Paul M. Davis of Nashville; George B. Howell of Tampa; Wiley L. Moore of Atlanta, and Stuyvesant Peabody of Chicago.

A. N. Kemp Heads American Airlines

Alexander Nesbitt Kemp, chairman of the board of directors of Pacific Mutual Life Insurance Co., was elected president of American Airlines by the board of directors on Apr. 9, succeeding C. R. Smith, who resigned to serve as a colonel in the Army Air Forces.

Kemp

Kemp has been a member of the AA board since Apr. 1941. Until recently he was president of Pacific Mutual but has been elected chairman of the board and given a leave of absence for the duration in order to permit him to serve as president of AA.

He began his career with the Hong Kong and Shanghai Banking Corp. of London, England, and was later connected with N. W. Halsey & Co., San Francisco investment bankers. In addition to his connection with Pacific Mutual, Kemp is a director and member of the executive and management committee of Southern California Edison Co.

At its Apr. 9 meeting, the AA board also re-elected Chandler Hovey of Boston as a director.

UAL Board Re-Elected

At United Air Lines' annual meeting on Apr. 14 all 12 directors were re-elected. They are Martin C. Ansorge and Joseph P. Ripley, New York City; Gov. Sumner Sewall, Augusta, Me.; Frank W. Fuller Jr., San Francisco; Justin Dart, Boston; and Lester Armour, Mark W. Cresap, W. A. Patterson, John J. Mitchell, J. A. Herlihy, Paul M. Godehn and Robert M. Roloson Jr., all of Chicago.

United Consolidates All Flight Training

United Air Lines has consolidated all its flight training activities at Cheyenne, Wyo. Included are UAL's pilot training school heretofore operated at Tracy, Cal., and flight training activities of the UAL-owned Boeing School of Aeronautics at Oakland. Boeing School's ground instruction program will be continued at Oakland both on a commercial basis as well as for military personnel, but no flying students will be accepted.

Continental's Pay Boosted $200,000

CONTINENTAL Air Lines on Apr. 7 was awarded air mail pay of 48.5c per mile on AM29 and AM43, increasing the company's yearly compensation by about $200,000.

Because the rate was made effective as of Oct. 13, 1941, CAL will also receive approximately $85,000 in back pay.

The 48.5c rate applies to months in which average daily designated mileage does not exceed 6,028. When loads are over the base poundage of 300 lbs., the carrier will receive an excess poundage rate of .03c per airplane mile for each pound.

In months when daily mileage exceeds 6,028 miles, CAL will receive a rate to be paid for an adjusted base poundage, "such effective rate and adjusted base poundage to bear the same relation to 48.5c . . . and 300 lbs., respectively, as 6,028 miles bears to the average daily designated mileage."

For the 12 months beginning Jan. 1, 1942, CAB said that operating expenses of the carrier will be $1,193,584 against non-mail revenues of $357,277, or a break-even need of $836,307.

A proper net operating income allowance "will be approximately 3.77c per mile when related to the total airport-to-airport revenue mileage," the Board said.

"This amount is equal to a return of about 6% (after federal income taxes) upon an investment of $870,239. It is also equal to 14.61% (after income taxes) of the total estimated non-mail revenues of the petitioner, and 4.13% of the petitioner's total revenues, and will give the petitioner a ratio of operating revenues to operating expenses of 105.91%."

In the rate set, CAB allowed credit for $602 operating loss incurred on Wichita-Tulsa for the seven-day period between inauguration of service and the date on which the Post Office placed mail on the segment.

Schedules found required by CAB include four daily round trips between Denver and Pueblo and two daily between Pueblo and El Paso and Pueblo and Tulsa.

The Board refused to allow the company credit for expenses incident to placing of hostesses on AM43. It noted that hostesses were necessary on AM29 because of Civil Air Regulations requiring cabin attendants on flights above 12,000 ft. However, AM43 flights operate at 8,000 ft. or under, the Board claimed.

CAL's traffic and advertising expense for the year ended June 30, 1941, was equal to 28.3% of non-mail revenues, "which was the second highest for any of the domestic air carriers," the decision said. It allowed the company 20% for the future.

CAL's president incurred expenses for travel, hotel and incidentals totaling $9,501 in the year ended Sept. 30, 1941, the Board said, adding that "$4,158 of this amount is without sufficient explanation to enable us to test the reasonableness of the expenditure."

HEADLINES for HISTORY

4 CURTISS PLANES SHOOT DOWN 8 NAZIS ON LENINGRAD FRONT

Finns Report Seizure of Sev- Positions Be-

reported today [illegible] 300 square miles of [illegible] the Leningrad Front in five [illegible] of counterattacks after checking

TOMAHAWKS GET 15 NAZIS IN PROTECTING CONVOY

"GOOD SHOW, CHAPS"

20 Tomahawks Rout 60 Enemy

M'ARTHUR'S FLIERS SHOOT DOWN 2 JAPS IN BATAN ENCOUNTER

Curtiss Fighters Engage ive-Bombers; Mosquito n Active

NGTON, Jan. 27 (U.P.)— MacArthur's tiny

Me.'s fall apart in mid-air

FIRST big success of America's Tomahawk fighters was revealed yesterday.

A B.U.P. reporter interviewed South African fighters who shot down 15 Stukas and Messerschmitts.

The South Africans were out on "umbrella duty"—providing a sky screen for a British supply convoy off the Libyan coast. Suddenly a large formation of Stukas, escorted by several Eights of Me. 109's, came down out of the sun to attack the ships.

The Tomahawks [illegible] sailing into [illegible] soaring to [illegible]

[illegible] that [illegible] to the [illegible] lost. [illegible] but [illegible] and [illegible]

P-40's Go Into Action Against Odds

By the United Press.

WASHINGTON, Feb. 5.—American army fighte going to the aid of bomb-wracked Java in the Du Indies, have shot down two Japanese warplanes, them a bomber, in a battle against heavy odds.

The War Department said today one of th formation of United States P-40 fighters was l encounter over Java, where the Japanese air have assailed the United Nations base at

TOMAHAWK AIRCRAFT FOR TURKEY

FROM OUR SPECIAL CORRESPONDENT

ANKARA, Nov. 11

Five more American Tomahawk aeroplanes have arrived here, flying in record time from [illegible]. This brings the total number of Toma- [illegible] delivered to Turkey to 15. They are [illegible] under the Lease- [illegible] America under the Lease- [illegible] and ground tech-

Outnumbered 3 to 1 P-40s Defeat Nazis

British Take Buffalo Planes Straight Into Cloud of Foes in Libya

Special Cable to Buffalo Evening News.

LONDON, Dec. 9. — American-[illegible] planes—Marylands, Hudsons, [illegible] mahawks, Catalinas and Fort- [illegible]—have more than proved [illegible] worth in recent [illegible]

CURTISS FIGHTERS DOWN 17 STUKAS IN DESERT BATTLE

[illegible]stralian Nicknamed "The [illegible]ller" Gets Five German [illegible] in Libyan Fight

[illegible]ec. 8 (AP).—Buffalo-built [illegible] Tomahawk fighter [illegible] responsible for the [illegible] near the

P-40's Strike First Blow For Indies

Possible Vanguard Of Air Reinforcements Shoots Down T[illegible] Of Superior Jap F[illegible]

[illegible] de their [illegible] darting new [illegible] ed Press, [illegible] important [illegible]

[illegible] followed [illegible] ell, supreme [illegible] west Pacific, that [illegible] were en route to the battle [illegible]

Washington, D. [illegible] (UP)—American [illegible] pursuit planes [illegible] first blew [illegible] rich Dut[illegible] tackling a [illegible] Japanese [illegible] Java, shooti[illegible] bomber and a [illegible]

TOMAHAWKS GET BOMBER

"Practically Blew Up in My Face"—Pilot

"The thing blew up practically in my face," was the comment of a [illegible] South African Air Force pilot [illegible] at his [illegible]

TOMAHAWKS IN ACTION

Desert Shoot-up

Not a day's march from El Adem, the vast Libyan aerodrome which the Italians vacated ten months ago, [illegible] it a veritable [illegible] of [illegible]

[illegible] to dive- [illegible] the sands [illegible] and C-50 [illegible] our pla[illegible] leade[illegible] vent righ[illegible] and ME [illegible]

"CURTISS P-40S GET 20 NAZI PLANES, DAMAGE 10 OTHERS

R. A. F. Pilot Says "It Was Like Swatting Flies" as None Escape in N. Africa

[illegible]b. 16 (AP).—"It was [illegible] way they [illegible] British pilot [illegible] victory [illegible] the Axis [illegible] fought [illegible]

[illegible] Italian and [illegible] five minutes and [illegible] remainder of an Axis [illegible]

Buffalo-Made Planes Have Nazis on Run

So Declares Message To Curtiss Workers

[illegible] day. [illegible] own instr[illegible] er plan[illegible] perhaps the [illegible] stream of [illegible] forcements, [illegible] Southwest [illegible] announce[illegible] Major [illegible]

[illegible] patrol [illegible] bombers. I was right on its tail [illegible] my incendiary bullets [illegible] "The aircraft blew up [illegible] practically in my face. I [illegible] stick forward so hard in an [illegible] get down out of the [illegible]

[illegible] up the landing ground [illegible] by pilots of a [illegible] squadron. [illegible]

New Curtiss Planes Rout Nazi Aircraft

Aussie Fliers Down 5 Ships, Damage 7 and Lose One

CAIRO, Jan. 8 (AP).—Kittyhawk [illegible] fighters, a new improved version of the battle-proved Curtiss Tomahawks, [illegible] disclosed Sunday by [illegible] their first blood [illegible] on New [illegible]

Curtiss first on every battlefront

Australian Pilots Praise Kittyhawks And Tomahawks

American Planes Have Destroyed Over 130 [illegible]

CURTISS-WRIGHT Corporation

AIRPLANE DIVISION

BUFFALO, N. Y. COLUMBUS, O. ST. LOUIS, MO.

CPR Extends Control of Canadian Airlines

WITH ITS recent airline purchases, Canadian Pacific Railway Co. has firmly entrenched itself as the dominant force in the Canadian aviation picture.

Latest deals include acquisition of the entire capital stock of Arrow Airways Ltd. and Dominion Skyways Ltd., and a majority interest in Canadian Airways Ltd., Prairie Airways Ltd. and Wings Ltd.

The railroad, preparing for the post-war period, now controls all but one Canadian air transport company west of the Maritime Provinces and north of Trans-Canada Air Lines' main line.

In addition to the above airlines, CPR has acquired control of Quebec Airways Ltd., Yukon Southern Air Transport Ltd., Starratt Airways & Transportation Ltd. and United Air Services Ltd., the latter embracing Mackenzie Air Service Ltd.

The amount of money involved in the deals has never been officially announced. Several months ago, Canadian reports stated that six of the companies cost CPR $12,000,000.

Centralized control of the various Canadian airlines by the railroad is expected to eliminate much of the cut-throat competition which has been prevalent among these companies. Also, a more uniform service will result.

Not only is CPR interested in operating air service within Canada, but is said to be planning post-war routes to the Orient, Moscow, Europe and to all of the British commonwealth of nations.

One Canadian newspaper several months ago said CPR is so intent "on developing the run to the Orient . . . after the war . . . that the company has already arranged for first call on many of the pilots now flying bombers across the Atlantic to England."

Canadian Pacific Appoints Dickins and McConachie

CANADIAN Pacific Air Lines Ltd., which has become one of the largest operators in the world, has named C. H. "Punch" Dickins as vice-president and general manager, and G. W. G. McConachie as general manager of the western lines.

Formation of CPAL recently by merging numerous regional airline operations leaves only two small independent operators in Canada—Northern Airways, with only three airplanes, and Mason & Campbell, not currently operating.

Dickins, who will have charge of all operations of the company, is a pioneer airline operator in Canada. McConachie, who will be responsible for all of the airlines' commercial operations (about 11,000 miles) west of Ft. William and Lake Nipigon, has for some time been president of Yukon Southern Air Transport, one of the companies acquired by Canadian Pacific Railway. He has had a colorful career as a "bush operator" in the north country and has been long associated with development of cargo operations "north of the rails."

Dickins has headquarters at Windsor Station, Montreal, while McConachie is located at Winnipeg.

Other appointments announced by L. B. Unwin, CPAL president, were W. R. Patterson as comptroller, with headquaters at Windsor Station, and T. H. Moffitt as treasurer, also located at Windsor Station.

Announced by Dickins were the appointments of C. R. Troup and T. W. Siers as general supervisor of schools and general supervisor of repair plants, respectively. Both have headquarters in Montreal.

Troup will be responsible for the operation and conduct of all of the schools of the British Commonwealth Air Training Plan being managed by subsidiaries of the company. Siers will handle operation and conduct of all repair plants being managed by subsidiaries of the company, engaged on contracts with the Dominion Government for the repair and overhaul of aircraft and engines.

CPAL's present fleet comprises about 20 twin-engine planes and about 70 single-engine ships. For the time being Canadian Pacific Air Services will operate each acquired company separately under its own name although equipment has been pooled and a single top management established.

Fit to fight with the best!

It's a great service—the Air Force! And we at Western Electric are proud to do our share in adding to its fighting power.

For years we've made dependable radio equipment to coordinate operations on the nation's airlines. Today that experience is enabling us to turn out vast quantities of radio equipment so vital to coordinated, victorious war in the air.

LET'S GO! USA · KEEP 'EM FLYING!

Western Electric

Transport Fleet Shows Little Growth

Airline Seating Capacity Rises 6% in Year

By LEONARD EISERER

ANALYSIS of the domestic air transport industry's equipment situation at the beginning of this year, compared with a year ago, indicates that last year's record traffic marks were established only through efficient use of equipment on hand, with negligible increase in size of the industry's transport fleet.

According to a study of monthly reports filed by the airlines with the Civil Aeronautics Board, the domestic air carriers on Jan. 1, 1942, had a combined fleet of 351 passenger carrying transports—a net gain of six aircraft during a year when revenue passenger traffic went up 38% to a new high of 3,849,000, and express pound-miles climbed more than 50%.

Combined seating capacity of the 18 airlines totaled approximately 6,350 at the beginning of this year, or only 6% more than the 5,980 capacity on the same date a year ago.

The airline reports to the CAB show that during calendar 1941 the carriers acquired a total of 58 new transports at a cost of $5,389,852, and 212 new engines for $2,228,302.

Restrictive effect of wartime priorities on airline new equipment programs is evident in a comparison of these 1941 figures with 1940 when the airlines acquired 106 new planes, nearly twice as many as last year, and 356 engines, nearly 70% more than last year.

The 58 new planes acquired last year included 49 Douglas DC-3s, 4 Douglas Sleeper Transports, and 5 Lockheed Lodestars, while of the 212 new engines purchased, 143 were manufactured by Wright Aeronautical Corp. and 69 by Pratt & Whitney.

Fifteen carriers shared in the purchases with American and Penn-Central getting 6 DC-3s each; Braniff, Northeast, Hawaiian, and Western Air, 3 DC-3s each; Canadian Colonial and Chicago & Southern, 1 DC-3 each; Continental, 3 Lodestars; Delta, 4 DC-3s; Eastern, 9 DC-3s and 1 DST; Mid-Continent and National, 1 Lodestar each; TWA, 7 DC-3s; United, 3 DC-3s and 3 DSTs.

(Turn to page 42)

Airline Planes and Engines Acquired and Sold in 1941

	Transports Jan. 1, 1941	Transports Jan. 1, 1942	Aircraft Acquired 1941	Cost	Engines Acquired 1941	Cost	Aircraft Sold 1941	Engines Sold 1941	Amount Received
* American	61 Douglas DC-3 15 Douglas DST 5 Douglas DC-2	64 DC-3 15 DST	6 DC-3	$552 152	22 Wright	$216.702	5 DC-2 2 DC-3	19 Wright	$454.494
Braniff	8 Douglas DC-3 6 Douglas DC-2	11 DC-3 5 DC-2	3 DC-3	270.357	8 Wright	72.638	1 DC-2	4 Wright 2 P & W	45.200
Canadian Colonial	4 Douglas DC-3	3 DC-3	1 DC-3	93.916	2 Wright	18.462	1 DC-3	2 Wright	132.221
Catalina	2 Douglas Dolphin	2 Dolphin	.....	.....	.....	.....	.....	.....	.....
Chicago & Southern	5 Douglas DC-3 1 Lockheed Electra	6 DC-3	1 DC-3	91.129	3 Wright	31 170	1 Electra	6 Wright	32.786
Continental	3 Lockheed Lodestar 2 Lockheed 14-H	6 Lodestar	3 Lodestar	191.877	7 P & W	84.240	2 Lockheed 14-H	9 P & W	122.764
Delta	1 Douglas DC-3 4 Douglas DC-2 5 Lockheed Electra	5 DC-3 4 Electra	4 DC-3	398.996	11 Wright	111.048	4 DC-2 1 Electra	13 Wright	216.400
* Eastern	29 Douglas DC-3 5 Douglas DST 3 Douglas DC-2	35 DC-3 5 DST	9 DC-3 1 DST	816.392 102.915	33 Wright	332.032	2 DC-3 3 DC-2	17 Wright	282.856
Hawaiian	2 Sikorsky S-38C 4 Sikorsky S-43	2 S-38C 3 S-43 3 DC-3	3 DC-3	313.002	9 P & W	111.656	1 S-43	2 P & W	100.000
Inland	5 Boeing 247D	5 B-247D	.....	.....	.....	.....	.....	1 P & W	1.313
Mid-Continent	5 Lockheed Electra 3 Lockheed Lodestar	5 Electra 4 Lodestar	1 Lodestar	70.759	4 P & W	31.679	.....	2 P & W	5.300
National	4 Lockheed Electra 2 Lockheed Lodestar	2 Electra 3 Lodestar	1 Lodestar	61.499	2 Wright	20.100	2 Electra	3 P & W 3 Wright	70.495
Northeast	5 Lockheed Electra	3 DC-3 1 Electra	3 DC-3	294.501	8 P & W	98.918	4 Electra	8 P & W	120.000
* Northwest	13 Douglas DC-3 4 Lockheed Electra	11 DC-3 4 Electra	.....	.....	2 P & W	22.187	1 DC-3	3 P & W	145.992
* Penn-Central	13 Douglas DC-3 6 Boeing 247D	18 DC-3 4 B-247D	6 DC-3	566.256	16 Wright	152.915	1 DC-3 1 B-247D	4 P & W 2 Wright	157.424
* TWA	14 Douglas DC-3 10 Douglas DST 12 Douglas DC-2 5 Boeing 307	21 DC-3 8 DST 8 DC-2 5 B-307	7 DC-3	645.663	46 Wright	462.862	5 DC-2 1 DST	17 Wright	330.672
* United	37 Douglas DC-3 13 Douglas DST 15 Boeing 247D 4 Lockheed Lodestar	39 DC-3 15 DST 14 B-247D	3 DC-3 3 DST	305.946 318.971	27 P & W	333.237	4 Lodestar 1 DST	11 P & W	512.484
Western Air	2 Douglas DC-3 2 Douglas DST 5 Boeing 247D	5 DC-3 2 DST 5 B-247D	3 DC-3	285.511	12 P & W	128.456	.....	.....	.....
TOTALS	187 Douglas DC-3 45 Douglas DST 31 Douglas DC-2 2 Douglas Dolphin 24 Lockheed Electra 12 Lockheed Lodestar 2 Lockheed 14-H 31 Boeing 247D 5 Boeing 307 2 Sikorsky S-38C 4 Sikorsky S-43 345	224 DC-3 45 DST 13 DC-2 2 Dolphin 16 Electra 13 Lodestar 28 B-247D 5 B-307 2 S-38C 3 S-43 351	49 DC-3 4 DST 5 Lodestar 58	$5.389.852	143 Wright 69 Pratt & Whitney 212	$2.228.302	7 DC-3 18 DC-2 2 DST 8 Electra 2 Lockheed 14-H 4 Lodestar 1 Boeing 247D 1 S-43 43	83 Wright 45 P & W 128	$2.730.401

* During 1941, each of the following carriers lost one plane through accidents: American, 1 DC-3; Eastern, 1 DST; PCA, 1 Boeing 247D; Northwest, 1 DC-3; and TWA, 1 DST. In addition, United reported 1 Boeing 247D and 1 DC-3 destroyed by fire.

PAA Steamship Line Plan for Pacific Airline Disfavored by CAB Examiner

Sees Competition Stifled; Warns Against Monopoly

ASSERTING that the pooling of resources by Pan American Airways, Matson Navigation Co. and Inter-Island Steam Navigation Co. for the proposed operation of a local air service between the U. S. and Hawaii could "result in stifling any competition in the Pacific area in air transportation not only for the present, but for years to come," CAB Examiner Berdon Bell on Apr. 18 recommended that the companies' application for approval of the agreement be denied.

He warned that participation of steamship companies in operation of airlines, although not always prohibited, "must be scrutinized with caution."

If CAB upholds its examiner, some observers speculated that Matson and Inter-Island may file application for the route on their own. PAA would thus be faced with competition on another of its routes.

Also included in the agreement was a provision for furnishing of meteorological data to PAA by Matson, and for other miscellaneous service. Bell said these were not adverse to the public interest, but pointed out that as far as the parties were concerned the entire agreement stood or fell on paragraph 9 (provision for joint air service).

He noted that the proposal would "bring together the three foremost and most powerful transportation companies operating in the Pacific area." This fact, "coupled with the influential position enjoyed by these companies brought about through their vast holdings and the preeminence of their officers and stockholders in Hawaii, place them in a position to stall practically all competition.

"By the terms of the agreement a further restraint on competition exists between the parties. Subdivisions (I) and (J) of paragraph 9 contain the provisions that the proposed joint company is to conduct only a local service between the west coast and Hawaii and Pan American agrees not to compete in this service. Such apportioning of territory tends to restrain competition and has been condemned by the Board as being adverse to the public interest."

PAA 'Compromise'

The evidence, Bell asserted, "indicates that the elimination of Pan American's most likely competition in the Pacific area, Matson and Inter-Island, is one of the principal reasons Pan American entered into the agreement.

"It will be remembered that Matson and Inter-Island were contemplating inauguration of a Pacific air service prior to commencement of discussions which led to the formation and execution of this agreement. Thus, there is no consistency in believing that Pan American experienced any great enthusiasm in participating in the creation of another competitor, even though it might be less damaging. At least, it may be termed a compromise and a concession by Pan American.

"The consolation that will come to Pan American, however, is that it will be permitted to participate by joint control in the operations of this newly created competitor. The competition still would remain within the confines and control, by a merger of resources, of Pan American, Matson and Inter-Island.

"A muffled form of competition would be more acceptable and less devastating than open competition, especially if the competition were muffled by the parties in interest . . . Surely Congress intended to prohibit just such a monopoly as this agreement purports to create . . . With practically all landing rights and facilities and ticket-selling facilities owned or controlled by these three carriers, an outside air carrier would find it difficult to inaugurate service between these points. It is concluded, therefore, that such a monopoly, which tends to restrain competition, is contrary to the sound development of air transportation service between these points, and is adverse to the public interest.

"The participation of steamship companies in operation of airlines, although not always prohibited, must be scrutinized with caution. This measure of precaution becomes essential when, as is true in this case, the proposed airline will parallel the route of the steamship company and the interests of both steamship companies are so closely interwoven and inter-related."

Impasse?

He pointed out that under the agreement it is possible "when the interests of air and steamship transportation are in conflict, to experience an impasse, and in this way obstruct or retard the development of air transportation."

The joint operation, Bell said, would cost more than an operation by PAA, but he admitted that this increased cost might be outweighed through the advantages to be realized by the public.

Approval of the agreement might prove to be an "empty gesture" in view of priorities on equipment and materials, he stated.

Tokio Kid: Posters like these in Douglas Aircraft Co.'s California plants tell workers why they must conserve materials. Scores of combat aircraft are being salvaged literally from the floors of the plants and sent into the skies. In 1941 the proportion of scrap to raw material handled decreased 12% from 1940 and 40% from 1939.

Vigilant Eyes ... VITAL TO VICTORY

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15 YEARS OF SUCCESSFUL OPERATION

Reservations at leading hotels, travel bureaus or telegraph offices throughout the country

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Airlines Take War Job

(Continued from page 1)

on civil aircraft allocations for 1943 was cancelled at the request of the Military Director of Civil Aviation.

Lacking any positive official declaration on the point, it becomes probable that all transport aircraft production for the duration of the war will be solely for the U. S. Army, but there is no reason, at this time, to expect a disruption in essential airline service needed by civilians connected with war production. It is quite evident, however, that all travel by air not in connection with war production or the military, may be discontinued.

The Commanding General of the Army Air Forces is authorized by the Secretary of War to utilize the *air carrier organizations* or any part thereof.

The Secretary of War encourages all key airline personnel to stay at their posts as a civilian part of the air force organizations, until such time as "their country indicates it requires them in the armed forces."

The Military Director of Civil Aviation has been directed by the Secretary of War to transmit policies outlined by him to the civil air transport industry with a view to giving it a definite conception of the nature of the services to be rendered by the civil air transport organizations in the war program of the nation.

Generally speaking, the air transport industry has been handed a war job of vast size. With some 80 odd transport planes taken off commercial operations and converted into cargo planes, the air transport industry will have approximately 250 commercial airliners left in commercial service. This residue must carry the ever-increasing passenger, air mail and air express load for the nation. Even today, with only a percentage of the airliners removed from commercial service, the lines are running at peak capacity in almost every section of the country. Mail loads are running exceptionally heavy.

Civilians without priorities have already found air travel difficult; within 60 days civilians who are not connected with the war effort will find it virtually impossible to travel by air.

Airline executives are pleased with the War Dept.'s action. Not only will they be able to retain their organizations, but they will be playing a vital war role.

In the meantime more than one important executive of the air transport industry is being "drafted" for war duty in connection with the expanded Army transport program. One of these is C. R. Smith, who has resigned as president of American Airlines Inc. at the request of Lt. Gen. H. H. Arnold, to assume an important post in the Air Ferry Command. Smith has been commissioned as a full Colonel in the Air Forces.

Col. C. R. Smith

Although details are classified as military secrets, the task outlined for the air transport industry embraces a very great expansion of air transportation, all directed toward the war effort.

Because of the significance of the War Dept.'s action, AMERICAN AVIATION herewith publishes the complete text of the Department's announcement of Apr. 11:

Accepting an offer of the airlines of the U. S. to participate in the war effort, the Army Air Forces have decided to use approximately 25 percent of the nation's fleet of commercial airline transport airplanes for the carriage of military cargoes and personnel the War Dept. announced today.

The airliners will be allocated on a voluntary basis by the various airlines and will be operated under direction of the Commanding General of the Air Service Command. They will be used to augment the present air transport cargo service and will be maintained and operated by airlines personnel.

Passenger seats will be removed from airplanes designated for this service and the airplanes will be equipped for carrying military supplies and personnel only to such points and at such times as may be necessitated by military requirements.

Key airline personnel will be encouraged to stay at their posts as the most effective and patriotic course unless and until their country indicates it requires them in the armed forces, it was explained. Should this requirement arise, such personnel will be informed.

In accepting the use of the airline planes, the Army Air Forces made it clear that there is no disposition to minimize the importance to the nation and the war effort of civil air transportation. A memorandum dealing with the acceptance of the offer of airline assistance, stated:

"Civil air transportation is of vital importance to the war effort. Disruption in essential airline service is to be avoided whenever possible. However, airline service to the public cannot exceed that quantity which is essential to the successful prosecution of the war. Any additional facilities should be placed at the disposal of the armed forces."

The decision to accept approximately one quarter of the total number of airline planes now in operation in the continental U. S. is based upon a survey of the civil air transport system and the nation's present air transport requirements. With the airplanes which they will reserve for civil operation, the survey indicated, the domestic airlines will be able to provide "a common carrier service essential to the war effort."

"With the foregoing accomplished, it is deemed that domestic airline service will have been reduced to the minimum essential to the war effort," it was stated in the memorandum. "It is not presently intended to make further reductions in their airline equipment."

The Military Director of Civil Aviation was directed to transmit the new policy statement to the civil air transport industry "with a view to giving it a definite conception of the essential nature of the services to be rendered by civil air transportation in the war program."

AAF to Utilize Airline Operational Units

(Following is the complete text of the official War Dept. announcement of Apr. 20)

"NEGOTIATION of contracts which will make available to the Army Air Forces operational organizations representing the nation's air transport system now are being completed by the Air Service Command, Army Air Forces, and substantially all of the nation's domestic airlines.

The contracts, in process as a result of the recent decision of the Air Forces to utilize approximately 25% of the nation's fleet of commercial airliners for the carriage of military cargoes and personnel, will provide for the use of airline equipment and personnel on a strictly non-profit basis, it was revealed today by the War Dept.

The airlines will perform services for the Air Forces on a cost basis, as determined by the Civil Aeronautics Board, acting as a quasi-judicial body on behalf of the government. This understanding was reached at a conference held in Washington between representatives of the airlines, the Air Service Command and the Office of the Military Director of Civil Aviation.

Although the Army previously has taken over the operation of individual airplanes and had obtained individual personnel from the airlines, chiefly for Ferry Command operations, *this is the first time that the airlines, as such, have taken an organized part in the military effort*, it was pointed out. (Italics supplied.)

An important feature of the contracts is the fact that the equipment, while in operation for military purposes, will be maintained and operated by airlines personnel. It will be, in effect, leased to the government without profit or cost to the airlines.

Airlines representatives have agreed as to the number of planes and personnel each would place at the disposal of the Air Forces. The division of responsibility was arranged on such a basis that each airline, with its remaining equipment, *will be able to provide space for air mail, passengers and express essential to the war effort.*

The airlines have also given joint consideration to the matter of routes over which the various airline units will operate within the continental limits of the U. S. and to important outlying points. Efforts will be made to operate planes within areas with which the personnel is familiar, often over the same routes plied by the planes up to now. Planes and personnel may, however, be dispatched to such points and at such times as may be necessitated by military requirements."

Inspectors Needed

Army Air Corps has revealed the need of hundreds of aircraft procurement inspectors in New York and other cities along the Atlantic seaboard. Base salaries range from $1,620 to $2,600 a year, plus overtime. American citizens with mechanical experience on aircraft, aircraft engines, instruments, parachutes, and propellers are urgently needed.

PCA Granted Route Suspension

ADDITIONAL evidence that the airlines' new war role will mean a re-shuffling of present service was seen when Pennsylvania-Central Airlines asked and was granted permission to suspend all schedules on AM41, Detroit-Sault Ste. Marie, for the duration. The company said its request was made necessary because of the work it has undertaken for the Army. Although many airlines have altered schedules, AM41 will be only the second *route* to be suspended to date. The first was Braniff's Amarillo-Oklahoma City line.

Wood Hangar: Conserving strategic materials, Northwest Airlines has constructed the above hangar at Fargo principally of wood. Among structural innovations was the use of 13 glued-up wood arches, believed to be the longest ever built—152 ft. The arches, which form the frame, were built in halves and shipped from Wisconsin on three specially-arranged flat cars (picture on left). Matched wood roofing was nailed directly to the arches (center picture). The hangar, NWA says, will accommodate a DC-4.

Trading Summary

AIRCRAFT shares worked successively lower through a period of rather dull trading. Losses on the Big Board over the 10-day trading period ranged from fractions to 3¾ points. High spot of the interval came when American Airlines was granted a rehearing by CAB on an order cutting its air mail revenues. This stock was the most active of the thousand some-odd listed, advancing on this day a point in a generally declining market. Eastern Air Lines also among the 10 most active stocks, gained a point. Other air transport shares followed this trend and showed gains.

Despite the relatively few aircraft shares listed (about 27 out of a total of 1,238) they having been showing up consistently among the most active stocks in recent trading. Curtiss-Wright and Aviation Corp. shares have been in this category several times. Meanwhile, with the market generally hovering around seven-year lows, aircraft shares have been consistently setting new low marks in trading on successive days. As many as 15 of the 27 issues set new 1942 lows in one day's operations.

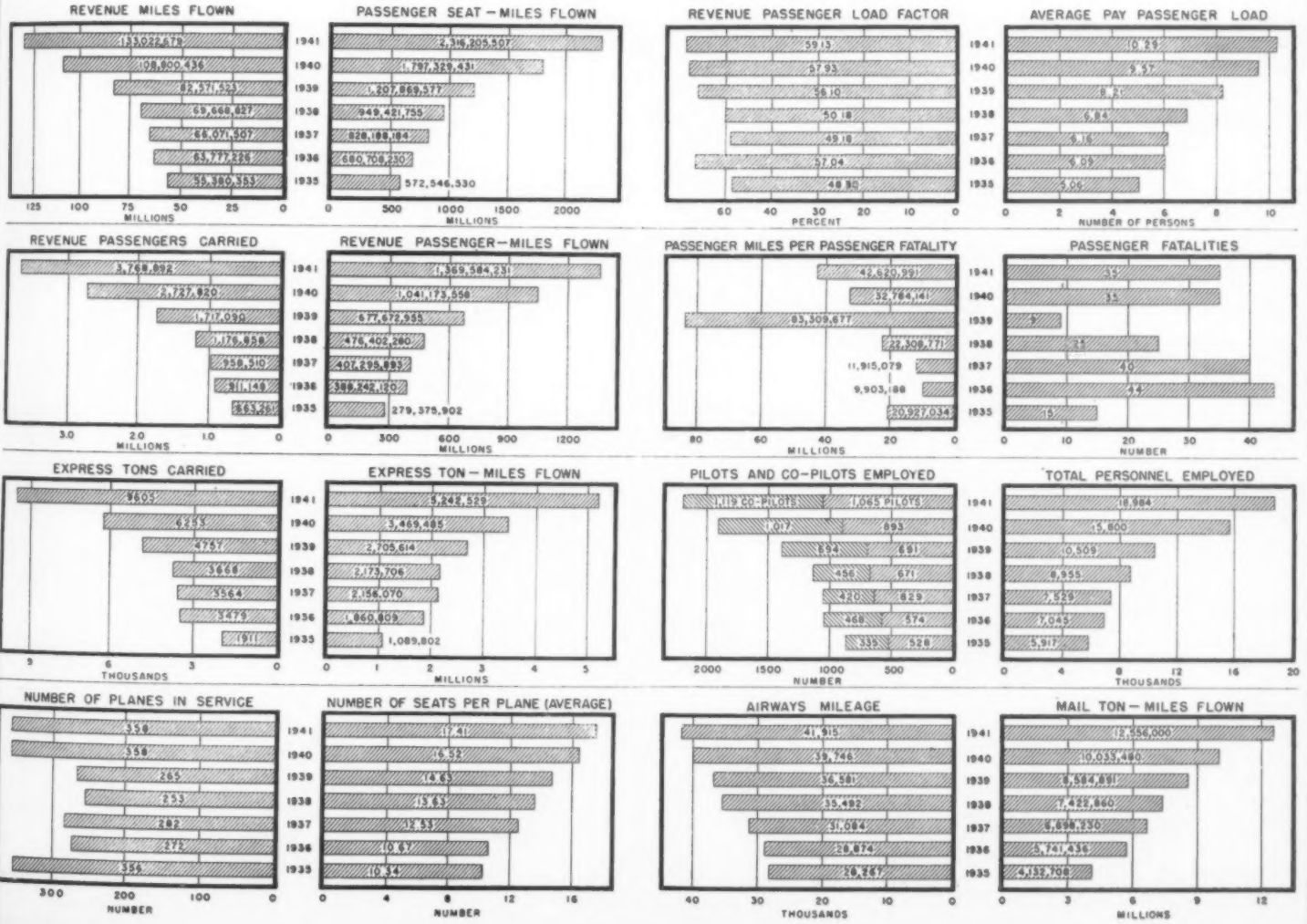
Losses on the Curb were mostly confined to fractions. Turnover was negligent all through the period.

Evidence that traders are still "long" on aircraft stocks despite the generally declining market may be found in the fact that of the total issues listed on Mar. 31, there were only two aircraft company shares in which a short interest of more than 5,000 shares existed or in which a change of more than 2,000 shares in the short position occurred during the month.

These were Bendix Aviation in which the short position increased during the month to 5,108 shares from 2,469 and Vultee Aircraft in which a short interest of 10,450 shares existed. The latter was admitted to trading Mar. 16.

7 Years of Domestic Air Carrier Progress

Prepared by CAA



Summary of 1941 Operations

Airline Profits Drop Despite Traffic Gain

Industry's Net Earnings Total $3,579,000

A STUDY of monthly reports filed by the airlines with the Civil Aeronautics Board reveals that aggregate net earnings of the domestic air transport industry last year dropped off 15% from the year before, despite new records set in every traffic department.

While total operating revenues of the industry were increasing 27% from $75,840,000 in 1940 to $96,327,000 last year, aggregate net earnings were declining from $4,235,000 to $3,579,000.

Costs Wipe Out Gain

The substantial gain in revenues was more than wiped out by a 28% jump during the year in operating costs. As a result of this upward swing in expenses, less than 4% of the industry's aggregate operating revenues last year was converted into profit after taxes.

Comparison of operating results for 1939, 1940, and 1941—the first three complete years during which air transport has been functioning under the Civil Aeronautics Act—shows industry profits lagging far behind the spectacular gains made in passenger, mail and express traffic.

During the first three years of the CAA-CAB regime, total operating revenues of 16 domestic airlines (includes all carriers listed in accompanying tables except All American, Catalina, and Canadian Colonial, which did not file comparable reports for all three years) were $55,010,000 in 1939, $75,675,000 in 1940, and $95,230,000 in 1941.

Net income after taxes for these same companies was $3,125,000 in 1939, rising to $4,060,000 in 1940, and slumping to $3,400,000 last year.

More in the Red

Analyzing the operating results by individual companies, it is found that each year more carriers have slipped into the red than were there in the preceding period: in 1939, 13 of these airlines operated at a profit, and only 3 at a loss; in 1940, 11 of the carriers showed profits, and 5 losses, while last year only 7 of the 16 companies finished in the black and 9 in the red.

Instrumental in reducing the industry's 1941 net profit below the 1940 figure was the increased percentage siphoned off of income by federal and state income taxes. These taxes last year took 42% of the industry's $6,264,000 net before income taxes, as against comparable percentages of 26% in 1940, and 20% in 1939.

Breakdown of the $96,327,000 total operating revenue received by the air transport industry last year indicates that 72% or $69,784,000 was derived from passengers, $21,868,000 or slightly less than 23% from mail, and $2,926,000 or only 3% from express. In 1940, passenger revenue represented 69.8% of all operating revenues received, mail income 25.6%, and express revenue 2.7%.

Comparison of 1941 airline traffic with the previous year shows revenue passenger miles up 31%, mail pound-miles up 30%, and express pound-miles up 51%. Of the 4,142,264 total passengers carried, 3,849,360 or nearly 93% were pay passengers.

AA's Profit Biggest

American Airlines, operating approximately 30% of the industry's total revenue passenger miles, reported the year's largest net profit of $2,473,156. Eastern Air Lines was the only other carrier in the million dollar profit class, showing earnings of $1,609,700.

The accompanying tables summarize in detail the operating results of the domestic airlines for calendar 1941, as reported to the Civil Aeronautics Board by the individual companies. Similar summaries, for the years 1939 and 1940, appeared in AMERICAN AVIATION, Apr. 1, 1940, and Apr. 1, 1941.

EAL Trains 75 Pilots

A pilot-schooling program has been initiated by Eastern Air Lines which will result in 75 pilots being trained and assigned to scheduled flying duty during the next seven months.

Transport Fleet

(Continued from page 38)

Largely offsetting the limited acquisition of new equipment by the airlines was the sale of 43 transports and 128 engines, most of them being released for military service. Total amount received by the airlines for equipment sold during the year was $2,730,401.

U.S. Takes 25

Of the 43 transports sold, 25 were taken over directly by the U. S. government, with 4 others going to the British Purchasing Commission.

The U. S. government purchased the 25 planes from 10 airlines as follows: American, 5 DC-2s and 2 DC-3s; Braniff, 1 DC-2; Canadian Colonial, 1 DC-3; Eastern, 2 DC-3s; National, 1 Electra; Northeast, 4 Electras; Northwest, 1 DC-3; Penn-Central, 1 DC-3; TWA, 1 DC-2 and 1 DST, and United, 4 Lodestars and 1 DST. In addition, the British Purchasing Commission obtained 4 DC-2s from Delta.

The accompanying tabulation, compiled from company monthly reports to the CAB, shows the aircraft owned by each airline on Jan. 1, 1941, and Jan. 1, 1942, the number and type of new planes and engines acquired during calendar 1941 together with total prices for each, and the number and type of planes and engines sold last year and the total amount received for the sales. Cost figures for transports acquired are for the airframes, exclusive of engines.

Summary of U. S. Transport Operations for 1941

(Compiled by AMERICAN AVIATION *from Monthly Reports to the CAB[a])*

	Total Passengers Carried	Revenue Passengers Carried	Revenue Passenger Miles	Available Seat Miles	Passenger Load Factor	Revenue Miles Flown	Mail Pound-Miles	Express & Freight Pound-Miles
All American	00	00	00	00	00	795,621	21,198,494	3,391,345
American	1,269,267	1,202,816	409,400,652	590,172,105	69.3%	32,098,663	5,871,577,025	2,718,489,667
Braniff	167,809	152,001	45,989,555	96,870,551	47.4%	5,574,706	647,769,687	222,712,701
Canadian Colonial	35,580	33,881	9,311,337	16,320,213	57.5%	786,094	25,028,723	15,252,577
Catalina	32,839	31,164	934,920	1,395,300	67.0%	138,597	00	4,831,188
Chicago & Southern	69,510	62,125	23,414,438	46,815,345	50.0%	3,327,573	313,592,092	108,048,693
Continental	23,667	20,293	5,955,508	17,634,816	33.8%	1,600,359	84,458,454	10,429,178
Delta	83,955	79,154	21,683,260	48,824,191	44.5%	3,044,037	271,191,950	49,569,948
Eastern	560,407	529,049	211,449,614	391,208,667	54.0%	19,841,436	3,407,325,246	1,268,969,185
Hawaiian b	49,041	48,855	6,235,027	9,927,837	62.7%	660,497	5,988,214	27,145,837
Inland	14,124	12,086	3,154,100	11,829,990	26.6%	1,254,110	40,501,187	5,571,339
Mid-Continent	40,517	35,634	9,134,646	24,577,974	37.1%	2,217,506	153,980,331	20,217,334
National	38,722	34,848	8,984,450	20,095,432	44.7%	1,531,830	101,277,031	18,662,745
Northeast	48,978	42,691	6,881,352	18,114,134	39.2%	1,395,210	26,261,201	9,383,825
Northwest	150,566	149,212	59,659,145	119,559,694	49.9%	6,209,328	1,871,311,191	416,048,017
Penn-Central	366,471	342,946	65,549,526	127,260,339	51.5%	6,455,168	403,161,347	272,523,708
TWA	482,860	439,575	202,533,923	344,567,370	58.7%	19,664,611	4,979,050,869	1,823,830,587
United	620,196	583,185	271,258,208	408,535,278	66.4%	26,230,709	7,470,303,504	3,247,420,704
Western Air	77,767	69,845	22,892,263	48,592,298	47.0%	3,078,389	846,396,223	283,202,213
TOTALS	4,142,264	3,849,360	1,384,421,924	2,342,101,324	59.1%	134,924,846	26,260,372,570	10,534,920,575

a Monthly reports to the CAB are subject to revision & year-end adjustment.
b Formerly Inter-Island Airways.

	Operating Revenue	Passenger Revenue	Mail Revenue	Express Revenue	Operating Expenses	Direct Flying Expenses	Indirect Flying Expenses	Before U.S. Net Income Income Tax	Transferred Net Income to Surplus
All American	$ 110,433	$ 00	$ 108,202	$ 2,229	$352,576	$196,332	$96,733	$247,690 (red)	$247,929 (red)
American	26,290,499	20,780,405	4,269,875	763,898	22,469,866	11,766,665	6,152,272	3,781,156	2,473,156
Braniff	3,339,964	2,119,924	1,114,991	70,185	3,465,527	2,150,817	846,029	153,437 (red)	172,739 (red)
Canadian Colonial	828,324	482,955	289,571	4,461	826,538	445,497	187,709	87,317	68,317
Catalina	158,726	156,088	00	1,793	160,292	68,450	29,654	1,011	925
Chicago & Southern	1,640,881	1,065,314	525,840	34,345	1,698,268	877,568	505,774	62,714 (red)	86,714 (red)
Continental	835,948	251,782	576,708	2,863	1,043,758	548,358	211,628	76,308 (red)	74,283 (red)
Delta	1,508,700	953,554	431,189	13,386	1,659,018	986,033	419,323	175,260 (red)	175,800 (red)
Eastern	13,668,055	11,027,368	2,042,359	377,411	11,163,208	6,420,832	2,737,139	2,517,243	1,609,700
Hawaiian	713,308	638,475	44,494	23,606	551,048	340,539	107,571	160,813	160,813
Inland	555,354	133,764	415,677	2,000	591,831	383,108	153,277	37,381 (red)	28,982 (red)
Mid-Continent	1,215,528	412,209	797,967	7,285	1,394,481	738,255	414,732	191,064 (red)	191,064 (red)
National	769,429	428,046	328,027	5,621	748,598	485,707	156,915	32,310	6,711
Northeast	787,053	378,561	351,489	3,825	878,082	460,109	294,470	96,131 (red)	96,131 (red)
Northwest	4,667,611	2,526,712	1,955,517	118,876	4,193,411	2,395,940	1,021,548	496,163	365,618
Penn-Central	4,434,603	3,721,452	692,665	95,505	4,566,023	2,680,320	1,163,276	98,929 (red)	93,929 (red)
TWA	14,048,992	10,240,653	3,049,424	481,959	14,604,316	8,120,258	3,405,805	563,784 (red)	563,784 (red)
United	18,735,476	13,411,602	4,064,648	848,011	17,785,468	9,271,430	4,757,512	880,625	619,625
Western Air	2,018,903	1,055,811	849,913	69,394	2,023,736	1,203,363	472,408	1,718	1,718
TOTALS	$96,327,757	$69,784,675	$21,868,854	$2,926,652	$90,146,055	$49,499,581	$23,163,805	$6,264,658	$3,579,228

Summary of U. S. Air Transport Operations for December

(Compiled by AMERICAN AVIATION *from Monthly Reports to CAB)*

	REVENUE PASSENGERS	REV. PLANE MILES	REV. PASS MILES	AVAIL. SEAT MILES	PASS. LOAD FACTR.	PLANES OPER.	EXPRESS LB.-MILES	MAIL LB.-MILES	PASSENGER REVENUES	MAIL REVENUES	EXPRESS REVENUES	OPERATING REVENUES	OPERATING EXPENSES	NET INCOME BEFORE U.S. INCOME TAX
ALL AMERICAN..	00	65,795	00	00	00%	9	319,517	1,950,370	$ 00	$ 26,318	$ 187	$ 26,505	$ 35,041	($8,670)[a]
AMERICAN.....	89,306	2,647,294	31,387,990	49,415,233	63.52%	83	352,962,804	609,176,547	1,637,435	377,775	92,110	2,158,814	2,013,592	96,627
BRANIFF.....	12,620	489,329	4,010,435	8,220,866	48.78%	15	27,779,170	74,283,546	188,772	84,086	7,672	286,546	280,681	5,095
CANADIAN COL..	1,947	52,208	563,571	1,096,368	51.4%	4[b]	1,429,135	2,687,717	31,668	21,174	610	60,462	32,247	27,371
CATALINA.....	967	4,800	29,010	52,800	54.94%	1	389,250	00	4,845	00	123	5,024	19,273	(12,560)[a]
CHI.& SOUTHERN	5,382	197,766	2,023,365	4,223,583	47.91%	6	9,428,822	31,404,799	92,063	48,392	3,115	146,286	149,839	(3,730)[a]
CONTINENTAL...	1,814	150,829	487,007	1,523,470	31.97%	6	1,399,935	8,024,292	20,940	50,202	306	71,936	89,423	(19,245)[a]
DELTA.....	7,538	255,923	2,178,614	4,149,680	52.5%	9	6,435,475	28,893,322	95,272	35,721	1,691	139,389	167,142	(29,108)[a]
EASTERN.....	45,403	1,738,387	18,788,071	34,230,767	54.89%	43[c]	138,519,467	341,680,975	995,165	182,020	38,620	1,237,800	707,557	531,567
HAWAIIAN*.....	4,305	45,707	598,579	863,900	69.29%	5	3,772,257	1,172,510	59,876	3,190	3,840	67,592	50,256	20,362
ISLAND.....	249	111,993	68,073	408,820	16.65%	5	298,194	3,239,377	3,039	37,048	142	40,237	54,130	(13,973)[a]
MID-CONTINENT.	2,581	192,728	667,584	2,184,553	30.6%	9	2,079,056	15,133,126	30,229	69,664	731	101,032	136,395	(34,740)[a]
NATIONAL.....	3,223	134,371	887,447	1,773,378	50.04%	5	2,192,046	10,361,539	45,278	30,716	535	77,531	67,748	19,545
NORTHEAST.....	2,797	87,192	481,144	1,961,316	24.53%	4	672,921	2,934,378	26,452	25,361	143	49,457	90,095	(41,072)[a]
NORTHWEST.....	8,640	480,774	3,569,214	7,700,287	46.35%	15	58,771,226	187,349,787	150,882	168,203	16,293	338,475	364,464	(25,779)[a]
PENN-CENTRAL..	27,108	563,516	5,458,756	11,262,348	48.47%	23	39,803,941	45,793,488	309,160	60,768	13,106	384,369	318,762	66,406
TWA.....	31,092	1,522,648	14,025,584	26,883,331	52.17%	46	243,825,901	520,661,023	707,643	271,868	58,931	1,066,939	1,375,463	(312,858)[a]
UNITED.....	35,428	2,048,903	17,984,136	29,335,832	61.30%	68[b]	493,226,780	781,177,275	888,253	334,151	95,091	1,356,138	1,699,299	(363,909)[a]
WESTERN.....	4,505	222,055	1,425,520	3,390,122	42.05%	12[d]	26,674,772	53,044,825	69,900	91,899	5,610	172,623	199,356	(23,409)[a]
TOTALS.....	284,905	11,012,218	104,634,100	188,676,674	54.4%	368	1,409,980,669	2,718,969,296	$5,356,866	$1,918,556	$338,856	$7,787,155	$7,850,763	($122,080)[a]
NOV. TOTALS....	307,683	11,628,983	107,867,192	202,615,583	53.2%	360	938,238,234	2,251,541,332	$5,335,611	$1,930,846	$257,951	$7,646,499	$8,060,638	($424,843)[a]
OCT. TOTALS....	405,018	12,356,131	142,810,873	218,632,241	65.32%	365	960,592,053	2,419,073,165	$7,285,689	$1,922,225	$267,306	$9,602,711	$8,396,168	$1,200,493

All monthly reports to CAB are subject to revision and year-end adjustment.

(a) Indicates red figures. (b) Plus one rented plane. (c) Plus two rented planes. (d) Plus 20 rented planes. * Formerly Inter-Island Airways.

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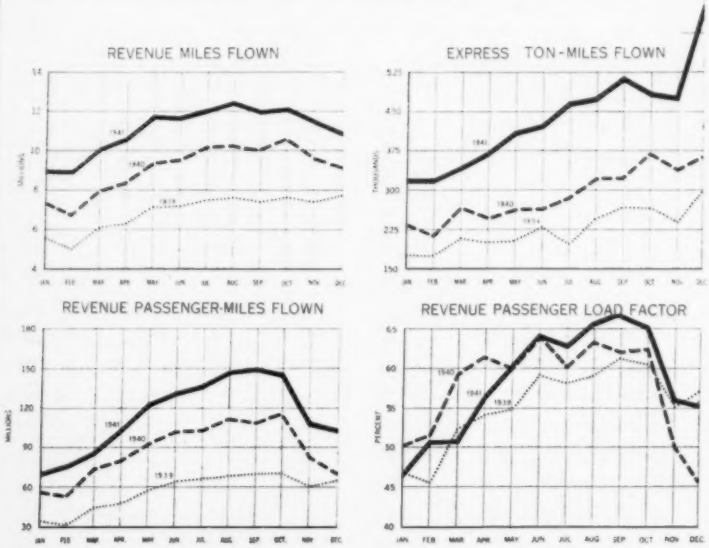
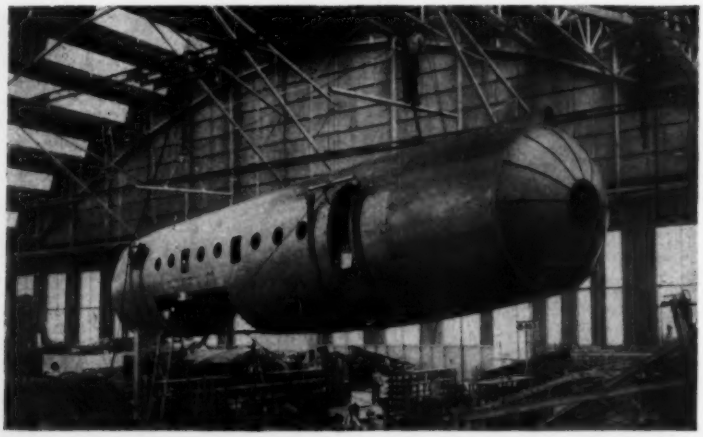
Airline Traffic Trends, 1939-1941



Prepared by CAA.

Overall View of the C-54 in Final Stages

Douglas Rushes 4-Engine Army Transports for War



Out of the Jig: The fuselage shell of the Douglas C-54, gently swinging over workmen's heads, comes out of the jig. The hemispheric after end of the fuselage was built as part of the pressurized cabin system for substratosphere flying.

Martin Sees Giant Planes on Post-War Ocean Routes

PREDICTING that the most "spectacular" post-war aviation development will be in the trans-oceanic field, Glenn L. Martin, president of Glenn L. Martin Co., has said that his company already has plans for a 250,000-lb. plane and added that "we should be able to build 500,000-lb. airplanes in a very few years."

Speaking before the Engineering Society of Detroit and the Institute of the Aeronautical Sciences, Martin asserted that "no technical considerations limit the size of airplanes that can be built; the only limit is the amount of payload available per trip."

Present trans-oceanic aircraft have maximum gross weight of between 82,000 and 84,000 lbs., and carry a payload of about 4,000 lbs. a distance of between 3,000 and 4,000 miles, depending on headwinds and fuel reserve needed, the speaker explained.

Compared with this present equipment, a 250,000-lb. flying ship, with fuel for 4,700 miles in still air, would carry payload of 50,000 lbs. from New York to London—"equivalent to 100 passengers with 80 lbs. of baggage apiece, plus 25,000 lbs. of mail, cargo and express," he added. On the eastbound trip, payload would be 60,000 lbs.

Elapsed time eastbound would be 13 hrs.; westbound 19 hrs. "Thus, we see, it would be possible to ride from New York to London quicker than we can ride by train from New York to Chicago."

Per ton-mile cost, Martin pointed out, is in inverse ratio to the size of the ship. The cost of the eastbound Atlantic trip would be about 24c per ton-mile, westbound 32c, or an average of 28c, he said.

$225 One Way

"If the airplane is operated at 75% load factor . . . an operating profit can be had if a passenger pays $225 one way, New York to London, or $400 round trip," he added (Present New York-Lisbon fares are $625 one way, $1,125 round trip—*Ed. note*).

"Passenger accommodations in this airplane will be luxurious indeed. For example, lavatory facilities will include bath and shower. Lounge space will be large enough for such amusements as table tennis. Except for such things as swimming pools and air promenade decks, we shall be able to compete on very favorable terms with the comforts of a luxury surface liner.

"We never talk about very large aircraft that someone doesn't pop up with the old too-many-eggs-in-one-basket wheeze. That's wrong. The navigational aids and safeguards required for a 25,000-lb. airplane can be doubled in our 250,000-lb. design. The old standard of four engines for ocean air vessels will be increased in this airplane, with plenty of power."

Out of this war, Martin said, "is coming, paradoxically, safety for air travel of the post-war era." He pointed out that a soldier at Pearl Harbor the morning of Dec. 7 "clamored into deaf ears that there were airplanes in a region 150 miles from his post. How did he do it? Well may you wonder. But imagine such a power devoted, by airplanes and ships, to detecting navigational hazards many miles away without dependence on visual or audible warning signals."

Martin also mentioned a "device by which we can see through fog" which can be put to commercial use.

Workshop: Inside the Douglas C-54, military version of the original DC-3, workmen of Douglas Aircraft Co. are busy with electric tools. An improvised work stand provides a solid platform for the men during this particular construction job.

Freight Development

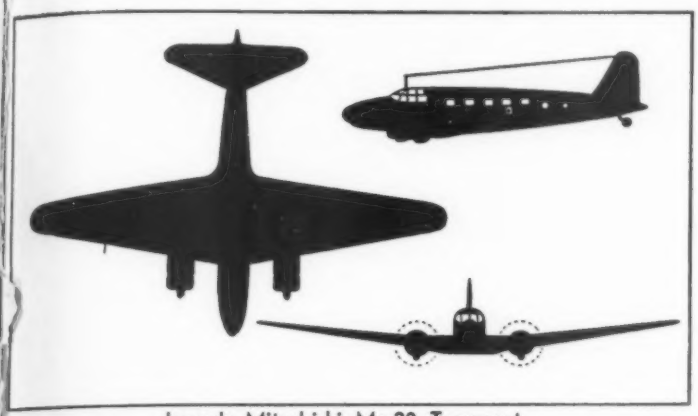
Air freight, domestic and foreign, will become a very important part of our commerce after the war, he predicted. "It has been hampered in the past by restrictions and monopolies, and its first tottering steps were halted by hostilities. . . .

"That all first class mail will travel by air in the future peace is a foregone conclusion. It has been a long time coming, but it is historically true that the mails have always found their way into the fastest means of transportation available, although never without a fight."

Speaking of the war, Martin said that "on the evidence, I must assert that no armed force can be successful on any major project without air supremacy in its theater of war."

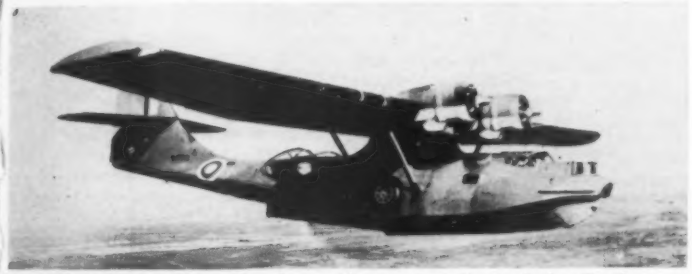
He added that "the extreme mobility of great naval air forces would answer in large part the desperate need we now find for a two-ocean navy. . . .

"I have no hesitation in predicting . . . that when peace comes, every nation that preserves its integrity will see to it that strong air forces will be an important part of its permanent military establishment."



Japan's Mitsubishi Mc-20 Transport
With Capacity for 11 Paratroopers, It Stems from the DC-2

The XPBY-5A Before the Navy Accepted
It was Destined to Become the Famous Catalina



The PBY-5A Operates from Almost Any Part of the Earth
Speed is Approximately 200 MPH.; Range, Over 4,000 Miles

Belly Tank: Latest photo of the Bell P-39D Aircobra shows the addition of a belly tank to augment normal fuel supply. The bomb-like, streamlined tank can be dropped in flight after its contents are exhausted.

Pay Increases Favored For Braniff, PCA, MCA

AN EXAMINER'S report and two show cause orders issued last fortnight will, if adopted by the Civil Aeronautics Board, result in air mail rate increases for Pennsylvania-Central Airlines, Braniff Airways and Mid-Continent Airlines.

CAB Examiner Herbert K. Bryan recommended new rates for PCA which would allow the company a return of approximately 7.5% on its investment after deduction of federal income taxes.

At the same time, a CAB order directed Braniff to show cause why its rates should not be set at a figure which would increase total mail revenues by $450,000 yearly.

Rates recommended for PCA, on a system basis, were (1) from Oct. 9, 1940 through Sept. 30, 1941, a base rate of 24.81c per airplane mile, (2) after Oct. 1, 1941, until further order, (a) for any month during which average daily designated mileage does not exceed 13,508 miles, a base rate of 13.15c for 300 lbs., plus excess poundage rate of .03c per mile, and (b) for each month with daily mileage over 13,508, a rate to be paid for an adjusted base poundage, so that the rate and adjusted poundage will bear the same relation to 13.15c and 300 lbs. as 13,508 miles bears to the average daily designated mileage.

PCA's former rates were 13c on AM14, 28c on AM32, 38c on AM34, and 36c on AM41. No rate had been set for AM46, AM51 and AM55.

During the period Oct. 9, 1940-Sept. 30, 1941, Bryan stated that PCA "flew 3,776,305 pay-mail miles, realized $3,383,802 in non-mail revenues, and on the basis of adjustments considered, incurred $4,060,130 in operating expenses. Mail compensation required to break even amounted to $676,328, or 17.96c per pay-mail mile.

"From Oct. 1, 1941, it is estimated that the carrier will fly 4,472,901 pay-mail miles annually on the basis of the presently designated mail schedules. Non-mail revenues in estimated at $4,543,666 and operating expenses at $4,848,675, resulting in mail compensation of $305,009, or 6.82c per pay-mail mile, necessary for the carrier to break even."

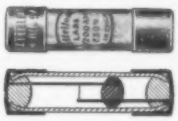
Bryan then recommended that PCA "be allowed a net operating income allowance . . . of 6.85c per pay-mail mile for the period Oct. 9, 1940 to Sept. 30, 1941, and 6.33c . . . thereafter. Such figures would amount to 7.6% and 6.2% of the non-mail revenues and would allow the carrier a return of approximately 7.5% (after federal income tax of 31%, estimated) on its investment for the respective periods."

For Braniff, CAB proposed the following system rates: (1) from Oct. 9, 1941, and terminating 10 days after the effective date of the final order, a base rate of 29.58c

(Turn to page 46)

Littelfuse Locked Cap Assembly, U. S. Pat. 1922642

YOU CAN'T LOOSEN THE CAP ON A LITTELFUSE!



No cement used. As diagram shows, fuse ends are constricted, providing for exclusive Littelfuse process of *everlasting* lock. Cap with markings will not be lost! Littelfuse process also waterproofs and hermetically seals filament.

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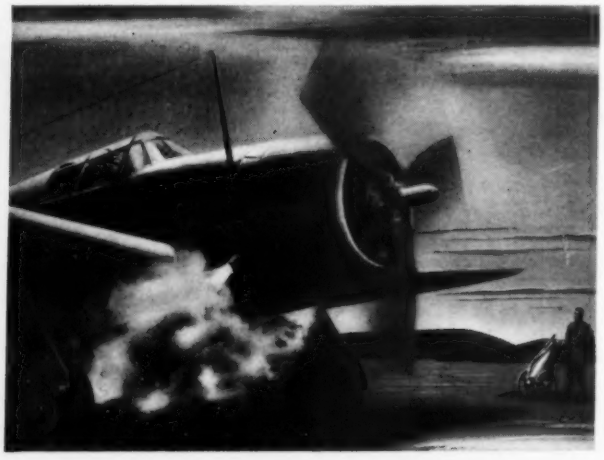

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Pay Increases

(Continued from page 45)

for base poundage of 300 lbs., plus excess poundage rate of .03c per airplane mile for each pound over 300, provided average daily designated mileage does not exceed 15,-124 miles; (2) for the period commencing on the 11th day after the final order, and until further order, 24.83c, under the same conditions as (1) except that daily designated mileage is set at 17,812 miles. When daily designated mileage is exceeded, the rate would vary under the same formula quoted in the PCA report.

Present Braniff rates are 17c on AM9, 23c on AM15 and 28c on AM50.

The new rates will produce estimated mail compensation of $1,500,-455 annually, compared with $1,050,-493 actually received by the company during the 12 months ended Oct. 31, 1941.

"We are of the opinion," CAB said, "that the reported results of . . . operations exhibit an excellent record on the part of the petitioner, particularly with respect to economy of operation and efficient use of its investment. Petitioner has demonstrated its willingness and ability to operate at economical levels of cost, as evidenced by its reported cost of 62.5c per revenue mile for the year ending Oct. 31, 1941, and the cost of 65.46c per revenue mile estimated herein for the future. Similarly, the ratio of petitioner's investment to its gross revenues evidences efficiency in the use of its capital.

"These factors are given consideration in determining the rates fixed herein . . ."

The 24.83c rate would yield a total net operating profit of $206,984 yearly, CAB said. This would give Braniff a return of 8.09% (after federal income taxes estimated at 31%) upon an investment of $1,764,200. Net i[illegible] after taxes, would be 5.36% [illegible]-mail revenues, "which will co[illegible]itute approximately 64.5% of petitioner's total revenues, and such income will likewise be equal to 3.46% of petitioner's total operating revenues . . ."

Both the examiner's report and the show cause order allow Braniff and PCA a general increase of 2% in costs to provide for the current trend of rising expenses.

For Mid-Continent Airlines, CAB proposed a system rate of 41.83c per airplane mile, which would increase the company's yearly mail revenue by $180,000. In addition MCA would receive $60,000 in retroactive pay to cover the period from Dec. 30, 1941, date upon which the proceeding started.

The 41.83c rate would apply in months when daily mileage does not exceed 6,994 miles. A formula similar to that in the Braniff and PCA cases would be used to determine the rate in months when mileage exceeded that figure.

In setting the proposed pay, CAB found that MCA should receive 38.74c to cover the margin between non-mail revenues and reasonable operating expenses, and in addition "is entitled to reasonable net earnings . . . We conclude that a reasonable earnings element . . . is 3.09c per aircraft mile flown with the mail. This element represents 6% of the investment of $814,568 found reasonable herein after payment of federal income taxes at a tax rate of 31% . . .

"Whether petitioner actually realizes this rate of earnings will depend, of course, upon the margin it maintains between its non-mail revenues and its expenses."

CAB concluded that on and after Dec. 30, 1941, "the salaries of stewardesses were and are an unreasonable expense" for MCA. "In general it is our position that those expenses incurred to provide increased comfort and luxury for passengers and where no considerations of safety are involved should narrow the margin between non-mail revenue and expenses by inducing more than compensatory additional travel," CAB said. "They should not increase the carrier's need for government support."

CAB also found that MCA's indirect flying expenses "appear disproportionately high" in comparison with similar carriers and that general and administration expenses "are high."

MCA now receives 38c on AM25 and 34c on AM48. It had requested a system rate of 51c for the period Nov. 1-30, 1941, and 54c thereafter.

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Airline Personnel

Traffic and Sales

James E. Middleton is now manager of Canadian Colonial Airways Ltd., and is also serving as Canadian traffic manager of Canadian Colonial Airways Inc.

Gene Halliburton, TWA passenger agent at FW, has been transferred to AB and has been replaced by **Bill Kelly** from CC.

Mary Walsh has been assigned to Pan American's NY traffic department.

American has made the following promotions and transfers: **C. B. Leidersdorf,** former chief passenger agent in CG, promoted to assistant station manager; **F. Stevens,** promoted to chief passenger agent in CG; **W. C. Coman** replaced Stevens as assistant chief passenger agent; **E. J. Milano** transferred from chief operations agent in RC to chief passenger agent in WA; **D. J. Carr,** former CC agent, named assistant chief passenger agent in WA; **D. J. Davis** promoted and transferred from assistant chief passenger agent in BJ to chief operations agent in CC; **C. F. Sanders,** formerly agent at NA, promoted to assistant chief passenger agent at BJ.

New United reservations and counter sales personnel include: **Miss M. A. McMakin** and **J. R. MacDonald** at CG; **Miss Margaret DeVault, Miss Betty E. Paul, Aldren J. Frye** and **Dorothy Fleischmann** at LA; **Miss D. M. Bethschieder, Miss M. Newmith, David V. Kent, Miss Janet Waite** and **Robert Enrich** at NY; **Miss Marion O'Conner** at SF and **George Carlson** at SA.

Frank Van Gillue heads a staff of seven in a new ticket reservations office in the OA traffic department of United.

Operations

American has announced the following promotions and transfers: **M. K. Davis,** formerly station manager at AZ, transferred to TZ; **O. A. Schenk,** formerly station manager at ER, replaces Davis at AZ; **R. A. Palmer** transferred and promoted from chief operations agent at OL to station manager at ER; **W. A. Davis** transferred and promoted from agent at FV to chief operations agent at OL; **Hugh Wilson** promoted from chief operations agent to assistant station manager at WA; **H. H. Olsen** transferred from PR to WA to assume Wilson's former job; **J. R. Williams** promoted from agent to assistant chief passenger agent at WA; **F. M. DeClercq,** formerly in RC, is now assistant chief operations agent in WA; **T. O. Roberts,** formerly agent at CV, is also an assistant chief operations agent in WA.

Capt. Ray C. Shrader has been promoted to vice president-operations of Braniff, and **Capt. R. W. Pears** has been named system chief pilot.

Edgar Coulon is Northwest's 1,000th employe. He is working in the maintenance department.

W. M. Hawkins, former TWA reserve captain at KC, is now a captain in CG.

Braniff has promoted **Tracy Walsh** to divisional operations manager; **Jack Brough** succeeds Walsh as flight superintendent, and **Jack Daugherty** succeeds Walsh as supervisor of stations.

John Durkovic, formerly of the Boeing School, has been made assistant to United's superintendent of communications at CG. **H. L. Garrison,** formerly chief operator of SL communications, is now assistant superintendent of United's communications at SF. Replacing him at SL is **C. H. Fitch,** formerly of PD.

Reserve Captains **W. B. Bails** and **G. L. Fly** have been transferred from Pan American's Atlantic division to the western division at JI.

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Boeing Sets Up $3,000,000 War Damage Reserve Funds

MARKING the first aircraft company taking public cognizance of the possibility of its plants being bombed as a result of the war, Boeing Aircraft Co. has established a reserve of $3,500,000, which President P. G. Johnson refers to in his annual report with the explanation that "it must be recognized that the company may suffer serious losses from damage to its plants through enemy action."

Johnson also advised stockholders that due to quantity production and completed facilities of buildings and equipment, costs of Flying Fortresses can be revised downward. This is in conformance with the 1940 contract for Flying Fortresses entered into on a fixed price basis, with a provision that after a certain number of aircraft had been delivered, the costs would be reviewed and if less than estimated, the company and the government would then endeavor to arrive at a mutually satisfactory price.

Facilities acquired at Seattle under an EPF contract were completed during the year and the full cost financed through bank loans. Payments due under this contract have been assigned to the bank and the company has a contingent liability on this indebtedness. A second EPF contract was entered into during 1941. Boeing directors are considering the purchase of certain of these facilities outright and assuming full liability on the bank indebtedness.

The EPF contract at Wichita was taken over by the Defense Plant Corp. and the company has no further liability thereunder, except for a lease agreement for use of these facilities. The new Lake Washington plant now under construction for building Navy aircraft is being constructed by the DPC, for lease to Boeing, the report states.

Consolidated statement of company and subsidiaries (Boeing Aircraft Co., Seattle; Wichita Division of Boeing Airplane at Wichita, Kans.; and a new division of Boeing Airplane Co., Lake Washington, Wash., but excluding Canadian subsidiary) shows net profit for 1941 of $6,113,143, or $5.65 each on 1,082,454 shares of $5-par capital stock. This compares with a 1940 net of $374,655, or 34c a share.

Sales of planes and parts, the greatest in the company's history, amounted to $93,893,089. Proceeds of sales of engineering and other information and manufacturing rights were $3,317,224. Other income from discounts, royalty and license fees, interest, etc., was $286,016.

Cost of sales was $69,455,898. For provision to reduce inventories of experimental projects to estimated sales value, a deduction of $1,400,000 was made; provision of $3,500,000 covered contract adjustments and indeterminate expenses resulting from war-time conditions; a reserve of $16,150,000 was set aside to cover taxes, including provision for estimated Federal income taxes of $4,070,000. Federal excess profits taxes of $12,025,000 and state income tax of $55,000.

Consolidated Balance Sheet as of Dec. 31 (excluding Canadian subsidiary) shows assets $93,383,448; current assets $77,799,298; cash $6,178,259; cash restricted for use on contract with U. S. $20,125,797. Current liabilities $65,611,238; capital stock $5,409,321; paid-in surplus $4,637,433; earned surplus since Sept. 30, 1939, $5,809,623.

Net profit of wholly-owned subsidiary Boeing Aircraft of Canada, Ltd., was reported separately due to dollar exchange differences. This amounted to $72,798 (Canadian currency) in 1941 against $10,347 in 1940. Balance sheet as of Dec. 31 (Canadian dollars): assets $1,352,389; current assets $1,174,447; current liabilities $911,470; capital stock $693,046; surplus $381,430 (red).

No Gossip: Lockheed's plant engineer, J. Russell Weil, has devised a rumor board and placed it in a strategic spot in the big aircraft plant. Now, when a worker repeats a rumor, his teammates tell him to write it on the rumor board and sign his name to it. The "Little Japs Have Big Ears" cartoon, in enlarged form at bottom, was drawn by Dick Shaw, creator of many AMERICAN AVIATION drawings.

Latest Dividends

Aviation Corp.—10¢ paid Apr. 20, to stockholders of record Apr. 10; company paid 15¢ per common capital share on Dec. 20, 1941.

Manning, Maxwell & Moore—25¢, paid Apr. 2, record Mar. 31; company paid same amount on common on Apr. 2, last year.

Chicago & Southern Airlines—Quarterly of 17½¢ on preferred, paid Apr. 1, record Mar. 23.

Consolidated Aircraft Corp.—$1 paid Apr. 18, record Apr. 1; previous payment on common was $2 on Dec. 27, 1941.

Vultee Aircraft Inc.—Initial payment of 50¢, paid Apr. 18, record Apr. 6.

Liberty Aircraft Products Corp.—25¢ paid Apr. 14, to stock of record Apr. 9.

Cessna Aircraft Co.—$1, paid Apr. 30, record Apr. 20; made common payments of 70¢ on July 25 and $1.25 on Sept. 26, last.

Bendix Aviation Corp.—$1, payable June 1, record May 8; company paid like amount June 2, 1941.

Bellanca Plans Stock Issue

Bellanca Aircraft Corp. has filed a registration statement with Securities & Exchange Commission covering 57,412 shares of $1-par common. Offering price, use of proceeds, underwriters, etc., will be supplied by amendment to the statement.

Incorporations

Illinois—**Aircraft Training Corp.**, 75 E. Wacker Drive, Chicago; courses of educational training; 1,000 shares, n.p.v. Incorporators: Morris Dreyfus, Elsie Rhea Blumberg, Morton Jacobson. Correspondent: Morton Jacobson, 134 N. La Salle St., Chicago.

Indiana—**Republic Aviation Corp.**, Delaware corporation, admitted to Indiana to manufacture and sell airplanes and spare parts.

New Jersey—**Dart Aircraft Products Corp.**, 4300 Bergenline Ave., Union City; 100 shares, n.p.v. Incorporators: Herbert A. Muller, Carmen La Carrubba, and Viola E. Hakes, all of the firm's address.

New York—**National Airship Transport Co. Inc.**, New York City; aircraft of all kinds; 1,000 shares, n.p.v.; Barker D. Leich, 34 Madison Ave., New York City.

Ohio—**Cornelius Aircraft Co.**, 80 North Ave., Dayton; to take over work of the former Cornelius-Hoep Corp., according to George Cornelius, inventor of the Cornelius tailless airplane. Incorporators: George Cornelius, president; George Cluett II, vice president; E. H. Johnson, secretary-treasurer.

Warner Aircraft Co.

Warner Aircraft Co. reports net profit for 1941 of $280,824 after depreciation and Federal taxes, equal to 58c each on 499,952 $1-par capital shares. This compares with $95,124, or 19c in 1940.

Murray Corp. of America

Murray Corp. of America announces net profit for six months ended Feb. 28 of $735,026 after depreciation, interest and provision of $525,000 for Federal income taxes, but without provision for Federal excess profits taxes. Profit in corresponding period of preceding year was $472,532 after $173,000 for Federal income taxes.

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